DETERMINATION OF LEVEL OF EMERGENCY MEDICAL SERVICE IN THE MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT

EXECUTIVE DEVELOPMENT

By: Chief David F. Crawford
Mist-Birkenfeld Rural Fire Protection District

‘

An applied research project submitted to the National Fire Academy
as part of the Executive Fire Officer Program

August 2002

ABSTRACT

Mist-Birkenfeld Rural Fire Protection District provides Emergency Medical Services in rural northwest Oregon. The fire district provides intermediate life support as a maximum level of emergency medical service (EMS). A contingent of community residents requested that the district consider improving the level of EMS to the advanced life support level. The problem was that the fire district did not know what level of emergency medical service the citizens of the fire district would be willing to support.

The purpose of this research was to determine what level of EMS the citizens of the fire district would be willing to support. The following research questions were developed:

1. What is the average number of emergencies experienced in the fire district at the level of basic and intermediate life support and at the level of advanced life support?
2. What options exist that would result in EMS improvements in the Mist-Birkenfeld RFPD?
3. What level of EMS are the residents of the fire district willing to support?
4. What is the general level of satisfaction in the community with the currently available EMS?

Descriptive research was conducted to determine the answers to the research questions and produce recommendations for action. An extensive review was conducted of relevant documents. Surveys were developed and sent to local and regional fire

districts and to the community. The survey data were collected and analyzed together with information gleaned from literature reviewed.

The results of the descriptive research, expressed as 14 findings, were used to develop eight recommendations. The recommendations were then presented to the district's Board of Directors for action. The recommendations suggested that the district make no immediate changes in the EMS level of service, but to work on improving the quality of the program through personnel and resource development. Recommendations also urged that the district track EMS data carefully, fine tuning its goals and objectives and taking charge of the natural process of change. Finally, it was suggested the district recognize the strong positive relationships that exists between the community and the fire district.

Research indicated that implementation of these recommendations would improve quality of emergency medical service in the district without increasing costs, and build an even stronger relationship with the community.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES:

INTRODUCTION

Mist-Birkenfeld Rural Fire Protection District (M-B RFPD) is located in the remote mountainous areas of Columbia and Clatsop Counties in northwest Oregon. The fire district operates from four stations, located carefully to cover each of the seven population areas and using 11 pieces of emergency service apparatus, including two ambulances and one light rescue vehicle. The district currently lists 50 personnel on the roster. Two of them are paid, the rest are volunteers. Much of the district's 135 square miles are considered Frontier due to its difficulty to access (See Appendix R for map).

In the State of Oregon Emergency Medical Services (EMS) are assigned to Ambulance Service Areas (ASA), essentially EMS franchises. The ASA assigned to M-B RFPD includes the fire district plus 30 additional square miles of otherwise unprotected area, for a total ASA of 165 square miles. Access to most of the area is by logging roads or by foot. The local population is counted at 1300 people located in seven communities. Wood products and natural gas storage are the only major industries in the district. Few commercial properties or businesses have weathered the economic storms of the past few years (See Appendix R; OEA, 2002).

Since the middle of 1986 occasional requests have come to the fire district staff asking the district to improve the level of emergency medical service by making advanced life support (ALS) service available locally. When advised of the scope of the changes required to provide service at that level and the cost of implementing the service most people felt that the district was not yet ready for the change. However, in 2001 the Chairperson of the fire district's Safety Committee, representing a group of local citizens, wrote a letter formally asked the fire district staff to look into the possibility again. The

Board of Directors assigned the Fire Chief to perform research to determine the level of emergency medical service the residents of the district are willing to support and then to present a recommendation for board action at the January, 2003 business meeting.

The problem is that Mist-Birkenfeld Rural Fire Protection District does not know the level of emergency medical service (EMS) the citizens are willing to support within the fire district. The purpose of this research project is to determine the level of EMS the residents of the Mist-Birkenfeld Rural Fire Protection District are willing to support. This research project will be descriptive in nature. The research questions are:

1. What is the average number of emergencies experienced in the fire district at the level of basic and intermediate life support and at the level of advanced life support?
2. What options exist that would result in EMS improvements in the Mist-Birkenfeld Rural Fire Protection District?
3. What level of EMS are the residents of fire district willing to support?
4. What is the general level of satisfaction of the community with the currently available EMS?

BACKGROUND AND SIGNIFICANCE

The Mist-Birkenfeld Rural Fire Protection District began formally to provide emergency medical service to the public in 1980. At that time, the district operated using three emergency medical technicians (EMT) and five persons certified by the State of Oregon as Crash Injury Managers. The district could provide only basic life support service due to the difficulty of obtaining volunteers certified to perform advanced life

support. When the Oregon Health Division (see definitions) adopted the EMT Intermediate (EMT-I) certification the path was opened to raise the EMS level of service provided by a substantial margin. The EMT Intermediate scope of practice (See Appendix C) was created specifically for rural areas with low population densities, answering the need for improved pre-hospital emergency medical care while relaxing the training and certification requirements which make ALS difficult for small, remotely located communities to support. The fire district developed five technicians certified as EMT Intermediates and then was able to provide intermediate life support service to the district. Additionally, advanced life support service is available from both Clatskanie Rural Fire Protection District and from Metro West Ambulance Service using a "meet en-route" protocol (See Appendix D).

The fire district continues to supply intermediate life support (ILS) service to the population using local volunteers. Currently twelve EMT-Basics and four EMT Intermediates are on the roster, including a paid Fire Chief and a paid Assistant Fire Chief, who operate as EMTs. Additionally, six firefighters are certified to operate the ambulances and two Registered Nurses operate at the EMT Intermediate level. Though current EMS call volume is about five times that of only ten years ago, the incidence of true advanced life support calls for EMS is less then 3% (See Appendix E) per year over the same period. The district currently has no certified advanced life support personnel (Paramedics).

The debate over whether the fire district should be providing advanced life support emergency medical service to the fire district's population has continued for several years. A formal request was presented by a group of fire district residents to

research the issue. This group believes that ALS service is the industry standard and to provide less is to do less than is possible. They also believe that implementation of advanced life support EMS in the community will save lives and that saving a single life is worth whatever the cost might be. (See Appendix A)

Another group of local residents, including some volunteer firefighters, oppose upgrading to paramedic level service. This group cites significantly increased operational costs and the small number of true ALS emergencies experienced by the fire district as evidence that the fire district cannot currently support adding paramedics to our roster. Because the fire district is currently operating at its financial limits, the Board of Directors decided to determine what options exist to improve EMS, to determine the costs attached to those options, and to determine the will of the residents of the fire district. If an option for improved service is identified that the district citizens are willing to financially support the Board could confidently place the measure on the local election ballot and begin the planning process.

While both groups believe that they represent the majority view it was clear after brief, informal conversations that neither group have identified the options that are available nor do they understand the costs attached to each option. It was prudent to assume that many other district residents may lack the information to make an informed choice. To test the assumption, the first ten local citizens unaffiliated with the fire district who visited the fire district offices were asked about the EMS service level in the district. After answering the questions, they were offered additional information as noted above (See Appendix B). There were marked differences in the responses before and after the informal testing was completed. Clearly, in order to obtain fair representation of the

willingness of the residents to support implementation of advanced life support services in the fire district, the district must provide some basic education regarding the issue.

The Mist-Birkenfeld R.F.P.D. Strategic Plan lists the expected growth for the fire district population over the next 10 years to be a maximum of 3% per year (OEA, 2002). Call volume for EMS incidents is expected to continue to rise at a rate of about 10% per year during that period (See Appendix E). Because increases in property tax funding are tied directly to growth in Oregon, it is apparent that funding will not be able to keep up with increases in emergency service responses (DOR, 2002; ORS, 2001). Financially, the district is currently able to operate with a small margin for emergencies. However, financial instability is already on the horizon. Moving to ALS will require a financial commitment from the taxpayers of the district.

The number of homes in the district is expected to increase slowly during the next decade, while the number of businesses will likely decline further (See Appendix R; OEA, 2002). The timber products based economy in our fire district has been depressed for some time and the prognosis for recovery is not encouraging. All of this places more strain on homeowners to pay for emergency services. Under these conditions, the fire district is hesitant to ask its citizens for more tax funding unless it is clearly their will.

This applied research project relates directly to enabling objectives three and four found in Unit 10, Service Quality/Marketing, of the Executive Development student manual dated December 1998. These objectives address adapting organizations to provide quality service and evaluating organizations to find ways to improve.

The research project also relates directly to all four of the United States Fire Administration's operational objectives. The subject of the research addresses options to

improve life safety for every person resident in the fire district, including those 14 years old or younger, those 65 years old or older and firefighters of every age. It also demonstrates development of a more comprehensive, multi-risk reduction plan led by the local fire district.

LITERATURE REVIEW

The literature obtained for research is reviewed below. References have been included indicating which research aspect is addressed in each document. Libraries were accessed at the National Fire Administration located in Emmitsburg, Maryland, at Oregon State University located in Corvallis, Oregon, at Washington State University through the Vancouver, Washington campus, at Peace-Health Medical Center located in Longview, Washington, and various public libraries located in northwest Oregon cities. Additional resources were found using various available Internet search engines.

Because research question two deals with EMS improvements in general and because the mission of the fire district includes "providing the highest quality service using all available resources", the sources below also provide information and suggestions which are prudent to include in the recommendation forwarded to the fire district Board of Directors.

Michigan's Rural EMS Report 2000

Michigan's Rural EMS Report 2000 (2002), prepared by the Upper Peninsula Emergency Service Corporation (UP-EMS), and published by the Michigan Department of Community Health in January of 2002, studies the status of rural EMS, identifies key factors that impact delivery of rural EMS, determines the importance of these factors, and describes the responses in a way that can be useful to policy makers. The executive

summary listed key findings ranked according to number times identified by responding agencies as their most critical problem.

The *Key Personnel Issues* section noted in the report indicates *issues relating to personnel* was identified as the highest ranked problem in 32.5% of the surveys. Nearly 43% of rural EMS agencies responding were licensed at first responder level, unable to transport patients. Nearly 40% of responding rural agencies reported as Basic Life Support or Limited Advanced Life Support levels providing primary or enhanced levels of pre-hospital care. Less than 20% of responding agencies are licensed at the Advanced Life Support level. Active EMS personnel from responding agencies included 19% ALS licensed, 42% licensed as BLS or Specialist EMTs, and 25% licensed as first responders, and that 75% of rural responders are volunteers. These findings indicate that in rural Michigan more than 80% of the area studied received basic life support at best, and that less than 20% of the area had access to advanced life support programs. The data is important to this study because it describes the make up of a rural EMS system for purposes of comparison, directly addressing research question two (potential for program improvement), and providing comparative information for question three.

Personnel issues identified with EMS personnel recruitment and retention included financial benefit (36%), training (25%), and recognition (24%) as the top three methods. This data is particularly important when considering recruitment of high quality personnel and retaining those who are trained and ready to respond as a means to improve the service level and delivery of prehospital emergency medical services in the rural setting.

"Financial Resource Issues" are listed in the report as the second priority with nearly 28% of responding agencies identifying this as their primary concern. Vehicles are identified as a primary need by respondents (33 %), followed by medical equipment (22.9%), service equipment (13%) and communication equipment (11.2%). Meeting program capital needs such as these is another means of improving the service level and delivery of prehospital emergency medical services in the rural setting.

"Training Issues" are listed as the third highest priority (16.1% of respondents). Training availability was the primary concern (27.3%), followed closely by cost of training (23%), distance to training (16.8%) and Internet access (33% reported no access to Internet). Meeting the needs of personnel for training is clearly a means to improve the service level and delivery of prehospital emergency medical services in the rural setting.

EMS Report 2000 does not address research questions one, three, or four. The report does not make specific recommendations.

What's Different About Rural Health Care?

According to a December 6, 2002, article published in the National Rural Health Association (NRHA) newsletter titled *What's Different About Rural Health Care*, there are significant and critical differences between obstacles faced by urban health care providers and those faced by rural health care providers. Based upon a study published in 1996, these key differences include the finding that rural residents have access to about half as many doctors in rural areas (10% of doctors serving 20% of the population). Additionally, rural populations tend to be older (17% more over 65) and tend to be poorer than their urban counter-parts (27% less per capita income), with 14% of the population

below the poverty level (24% of rural children are below poverty level). Rural residents are also less likely to have employer paid health care while experiencing higher mortality rates for both males and females (33% higher). Rural residents have twice the rate of death because of motor vehicle accidents as urban residents. Transportation to available health services is often difficult and at times impossible, resulting in a segment of the population who are unable to reach the services the need at the time they are needed.

The author noted problems contributing to these findings. They include "economic factors, cultural and social differences, educational shortcomings, lack of recognition by legislators and the sheer isolation of living in remote rural areas".

Information provided in this study is important because it goes right to the heart of the need for improvement in rural EMS. The descriptions of rural health issues read as a list of focal points for EMS refinement in rural areas. Many of the issues are socio-economic in nature, requiring political solutions as well as focused resources and training. NRHA provides baseline comparative information for the information developed in research questions one and three.

What's Different About Rural Health Care does not address issues pertaining to research questions two or four. No recommendations accompanied the information.

In a Perfect World…Is All EMS ALS?

Howard Rodenberg, MD, MPH, DIP (FM), authors an editorial page in the Journal of Emergency Medical Service (JEMS) on-line magazine. Dr. Rodenberg (2000a) poses the question, "Are there too many Paramedics in this world?" He argues that we, the citizens of the United States, have grown up in a culture where "more of everything is good", including more advanced life support personnel. His discussion

questions include, “Do ALS services make a difference?” and “Does everyone in EMS need to be an ALS provider?” These are tough questions in a culture where ALS service is considered the standard of the industry. We assume that ALS is *better*. The issue of what EMS level of service is appropriate given local conditions is precisely the issue Mist-Birkenfeld RFPD is striving to answer with this research project, addressing research question two.

Dr. Rodenberg suggests that *better* should be defined as an improvement in outcome – lives saved or decreased morbidity. This definition is the basis of his argument. He examines the available literature, admittedly limited, to determine the value of prehospital EMS and suggests that EMS has been proven effective in saving lives only as it applies to air-way management and defibrillation of pulseless cardiac arrhythmias, and possibly in the case of preventing trauma deaths (but *only* as a part of a complete EMS system). He then suggests ways in which these “advanced life support” protocols can be adjusted and applied in a basic life support environment by BLS personnel. In the case of Anaphylaxis, EMT-Basics can use preloaded medications to reverse symptoms, the same medication used by ALS personnel. Similarly, he addresses BLS application of lifesaving techniques for seizures, asthma, emphysema, cardiac emergencies and drug overdoses.

The proliferation of States where EMT-Intermediates are available blurs the line between ALS and BLS. The doctor suggests that the differences between an ALS and BLS become academic in this environment. Dr. Rodenberg calls for alternatives to traditional advanced life support certifications, the development of “a new class of

provider", and standardization of all state laws governing EMT practice, in every state, nation-wide.

In subsequent issues, many readers take issue with Dr. Rodenberg's suggestions (Rodenberg, 2002b, 2002c). Rodenberg (2002b) has numerous reader responses, none of which question the statistics quoted or the application of logic to the statistics. In one letter, his ideas are described as *thought provoking*.

Dr. Rodenberg (2002c) states he believes "that good application of BLS care with careful attention to ABCs probably saves more lives than the best in ALS techniques." More study is needed to determine what value the current EMS levels of service actually provide, measured by lives saved and by decreases in morbidity. "But," the doctor states, "If advanced BLS measures turn out, after study, to be as effective as ALS measures with less risk or invasiveness, logic would dictate we adopt them." Changes in Oregon's scope of practice for EMTs would allow EMT-Is to provide medical interventions never available before.

Rodenberg does not address issues pertaining to research questions one, three or four.

How Can States Ensure their Effectiveness

A 2000 study by the National Conference of State Legislatures (NCSL), examines the rising age of the population, the growing demand for emergency medical services, and the high strain that trend produces on EMS. There is concern expressed about the effectiveness of rural EMS in this environment. The study cites a federally commissioned survey (survey not identified, arguably *Challenges of Rural Emergency Medical Services*, NASEMSD, June, 2000) which identified recruitment and retention of

personnel as the number one rural EMS problem in the nation, closely followed by appropriate medical oversight and financing of local EMS programs.

Factors contributing to the high turnover rates and marginal performance many agencies are experiencing are identified as inadequate physician supervisor participation, lack of a satisfactory career ladder, inadequate leadership and training support, and insufficient equipment and supplies. The document states, “In rural areas, most needy of EMS, career personnel are in severe shortage because of the volume of work and the scarcity of resources.”

Low call volume and higher overhead costs experienced in rural areas require a large portion of the available resources to be spent on equipment, supplies and the fixed costs of maintaining the facilities and apparatus. Consequently, there is little left to pay competent, well-trained staff. Uncompensated volunteer EMS personnel are most agencies’ only option.

In order to broaden the financial basis of the rural agencies one recommendation suggested the further integration of rural EMS into the public health system, including non-emergency transportation of patients and fulfillment of a broader primary care and public health role in rural areas.

The study has several recommendations for states to adopt to improve rural EMS. First, the states are encouraged to develop incentives for local EMS programs to integrate more fully into the local public health care systems. Expansion of an agency’s mission and scope of services to address local non-emergency as well as emergency health care needs may indeed broaden the application of emergency medical skills possessed by emergency medical technicians and enhance their ability to become financially stable.

Another recommendation is for a new financial support model to be created, providing compensation for EMS agencies based upon preparedness to respond to emergencies and not by the total number of responses made. Experts believe this model would provide a stable environment for all EMS and that it would encourage attainment of complete preparedness for every identifiable emergency incident.

Creating statewide or regional EMS offices whose purpose would be to coordinate and fund management and clinical training of local EMS personnel and to provide technical assistance in recruitment and retention could enhance recruitment and training in rural EMS programs. Implementation of this recommendation would benefit rural and frontier EMS agencies directly and immediately. Additionally, provision of direct financial support through the awarding of grants or low cost loans to support "core" EMS personnel, equipment and supplies would allow the scarce resources available to be used more effectively, especially in volunteer agencies.

The last recommendation included in the study urges funding improvements in the infrastructure and technology of EMS communications systems. Communications is a critical part of all EMS, but particularly so in rural areas where response times can be extended. Innovations such as emergency medical dispatch can make a huge difference to the outcomes of responses in rural America.

The research presented information that applies directly to research question two, addressing the potential for improvement of EMS program service and delivery in the rural environment. The paper identifies rural funding issues and lack of profit potential in providing EMS transports. Suggested improvement strategies are designed to provide alternative program funding and to purchase equipment to enhance program efficiency.

One strategy in particular suggests expansion of the traditional emergency medical role of EMTs to include providing non-emergency medical services in the community as a means of providing financial stability.

How can States Ensure their Effectiveness does not address research questions one, three or four.

Emergency Medical Services Overview

The University of North Dakota publishes an Emergency Medical Services Overview section on its web site. Many of the concerns listed above are echoed here. The overview defines emergency medical services (EMS) as *a system of care for victims of sudden and serious injury or illness*. The document goes on to say *EMS plays a particularly crucial health care role in rural and frontier areas*. In rural and frontier areas, where hospitals and health care clinics are in short supply, prehospital EMS is often the only means of access to health care.

While crucial, EMS is not without serious problems. Among the problems the university lists are high cost of service to rural areas, fewer tax dollars to fund the program, and lack of access to private EMS programs due to low call volume and lack of adequate available resources. Additionally, challenges for rural agencies include increasing health care demands of an aging population, organizational instability, and poor access to training and medical supervision, volunteer shortages, dated equipment and inadequate insurance reimbursement for services.

Results from a study were included in the Overview, completed by the university's Center for Rural Health (1996). The study indicated that for the attendees of the state Fall EMS Conference the most pressing problems for North Dakota EMS were

retention of personnel (61%), recruitment of personnel (58%), getting time off from one's non-EMS job (26%), lack of community acknowledgment/recognition (15%), and inadequate medical direction (15%). The UND EMS overview goes on to state, "*Volunteer personnel donate their personal time to provide prehospital care and are usually expected to be available 24 hours a day, and on weekends and holidays*." Volunteers are the backbone of many EMS programs and as such need to be appreciated. Recruitment and retention are serious issues for EMS agencies that depend on volunteers.

The Overview does not address research questions one, three or four. There are no specific recommendations for action in the overview.

Personnel and Care Provision Needs

The University of North Dakota School of Medical & Health Sciences (2000) publishes a Rural EMS Initiative newsletter. Issue number four (June, 2000b) speaks directly to personnel problems and resource needs. The document identified recruitment and retention of volunteers as major problems for EMS squad leaders. Sixty percent of the leaders surveyed indicated that recruitment is a very difficult problem. Method used by the squad leaders for recruitment varied, but 86% of the squads said that *word of mouth* is the most often used method. Barriers to recruitment included time away from family, time away from job, low interest in EMS, Stress of EMS duty, inadequate/no pay, and others. The barrier most often noted (63%) is the training required to become an EMT and to continue to be an EMT.

Retention is described as somewhat difficult by 66% of those surveyed. Retention methods used, listed from most often used to least often used, included continuing education (74%), longevity awards (29%), Reimbursement/incentive pay

(27%), Free uniforms (27%), social gatherings (25%), public recognition (25%), and others (7%).

Resource needs were too numerous to list. The results were split out to represent BLS Squads and ALS Squads. It is interesting to note that the top two inadequate or marginal resource requirements for the BLS group were medications and training materials (supplies and training). For the ALS group the top two were vehicles and end tidal CO2 equipment (capital goods).

UND (2000b) provides information directly relating to research question number two. The material identifies issues affecting recruitment and retention of volunteers as well as resources needs. All of these concerns deal directly with the potential for improvement of volunteer EMS programs.

Issue number four does not address research questions one, three or four. There are no specific recommendations for action in the overview.

Volunteerism, A Family Affair

Irwin (2001) addresses the terrific toll the life of a volunteer EMT takes on their family and the strain that is placed on their home life. Irwin gives specific examples of first steps missed, of a child's education the volunteer is never quite able to help with, and all of those special times for couples that can never be made up. Irwin states that keeping open lines of appropriate communication is key to keeping the volunteer's family happy and keeping the volunteer mentally and emotionally healthy.

Irwin goes on to identify ways that leaders can help their volunteers adjust and balance the needs of their family with the requirements of their new vocation. The first suggestion is to provide an orientation training session with the volunteer and their family

present. It is important that the family feels a part of the decision to join and that they feel that through their volunteering family member they are also contributing to the well being of the community.

Next, Irwin suggests that fire districts stress "we are now your extended family. You can count on us." It is important that the new volunteer understands the purpose and the importance of debriefing after tough calls. Irwin advises setting up a positive atmosphere, especially with new volunteers. All human beings make mistakes. The only inexcusable mistake is the one that is not shared and does not result in a change in behavior.

Be straight with your volunteers, Irwin advises. Let them know what the fire district expects from them, as well as what they can expect from the fire district. Let them know what training is required (including dates and times where possible) and what training options are available after required training is completed.

As a leader, be sincere and *listen*.

Finally, and most important of all, make sure that each volunteer understands that their *family comes first*. This cannot be emphasized enough.

Irwin offers several other tips to keep volunteers their families happy. They include offering picnics and other social events for the entire family, physical training and instruction, relaxation classes, family counseling, recognition programs, skill competitions, multi-agency training, and last but not least, celebrate your volunteers in any way you can find.

Irwin focuses his material directly on the special stresses involved in the life of a volunteer EMT. The material addresses the potential for improvement of an EMS program, one element of research question two.

Irwin does not address issues relating to research questions one, three, or four.

Love 'Em or They'll Leave: Motivating Volunteers

McDowell (2001) wrote a motivational article dealing directly with volunteer recruitment and retention, two of the most critical problems experienced by volunteer fire districts in recent years. McDowell aims the material at primarily volunteer organizations, though the material may apply to career personnel as well. The author first examines the primary motivators for those who volunteer. The list is extensive, but includes friendship, feeling of belonging, personal development, to gain leadership skills, prestige, to challenge themselves, for fun, to relax or escape, and because there is no one else to do it. Ms McDowell colors the motivators by adding personal experiences that motivated her in joining an EMS company and staying a member.

The next section covers why people do not volunteer. Again, the list is extensive, but some of the entries do stand out. The list includes they weren't asked, it costs too much, it isn't convenient, poor organizational image, newcomers no readily accepted, afraid of blood, guts and gore, and afraid of infectious diseases.

McDowell notes that EMS is a field where members become family. She also cites as benefits of volunteering as gaining self-confidence, developing personal and institutional pride, learning to teach others, and professional growth.

The author suggests that individual EMS providers must define why they need volunteers. They may be sending the wrong message to their volunteers, contributing to unrest and dissatisfaction with the experience.

She also indicates that the EMS provider must determine what it is they want the volunteers to do. Once that is done it is a simple matter to document the findings with position descriptions. These should include, at a minimum, position title, purpose, position in chain of command, qualifications, time commitment, specific tasks and benefits of the position. Once the provider knows why it needs volunteers and what they want them to do, the job of recruitment is made much easier. Ms McDowell goes on to outline the recommended recruitment process. One comment in this section truly stood out. “When the prospect agrees to volunteer, do not leave him dangling. Get him to work straight away. Every volunteer wants something specific and meaningful to do. Don’t let them flounder or they will disappear.”

McDowell clearly identifies areas of potential EMS program improvements through understanding why people volunteer and answering the primary needs of their volunteers once that are members of the team. These are issues pertaining to research question two. Research questions one, three and four are not addressed.

Challenges of Rural Emergency Medical Services

Another approach to improving EMS delivery comes from the National Association of State EMS Directors attempts to establish the special challenges rural areas and their populations face. While not a scientific survey, it does identify many issues important to rural America.

Among the concerns listed are recruitment and retention of personnel, maintenance of appropriate medical oversight, financing (both operational and capital), skill retention, management training, compensation, continuing education, reimbursement, transport time and quality improvement (listed from most important to least important). Recruitment and retention, maintenance of appropriate medical oversight, and financing (both operational and capital) are clearly the top concerns garnering 46% of the listed responses. When asked about specific capital needs, communications equipment, medical equipment and ambulances were the priorities by a significant margin.

The findings of the study indicate that there are indeed significant needs in rural EMS and that fundamentally they boil down to funding. The study points out that "simply buying equipment will not solve all the problems, though it may provide a short term solution to some needs". "ORHP should strive to address problems facing rural EMS that cannot be solved by purchasing or construction, problems such as recruitment and retention of (EMS) personnel, appropriate medical oversight, staff retention, initial training and quality improvement." The study points out the need for long term financial support solutions as the ultimate answer to the most often cited problems in rural EMS.

Challenges of Rural Emergency Medical Services directly addresses the potential improvement of an EMS program, one element in research question two. Issues pertaining to research questions one, three and four are not discussed directly.

Rural EMS Initiative

The University of North Dakota School of Medical & Health Sciences (2000) supports a program titled the Rural EMS Initiative. This program is designed to identify and respond to the problems of rural EMS, and to educate the community regarding its findings and recommendations for action. The program's newsletter (2000a) includes a fact sheet highlighting rural problems and background information developed for the program. Much of the information pertains directly to the issue of improving EMS service in a rural community, addressing research question two.

The average United States citizen will use the services of an ambulance at least twice during their life. Delays in receiving well-organized EMS can put many rural residents at greater risk of permanent injury or death than urban residents. EMS has not been able to reach the same levels of "sophistication" in most rural or frontier areas as is possible in urban areas. Reasons for this difference include: (1) high cost of operation due to low population density and large service areas (1000 square miles and more); (2) state and local government of rural states have fewer resources to assist EMS providers; (3) failing rural economies often do not have resources to maintain public services and have difficulty responding to change; (4) rural communities do not have the call volume and profit potential to attract and support private emergency medical services to support the public need. These concerns address issues relating to research question three.

An additional destabilizing issue identified is the political pressure that is often applied to improve service levels by those moving into the rural environment expecting the same levels of service that were available when they lived in an urban community.

This concern is directly related to the community's general level of satisfaction, research question four.

Other concerns identified echo most of those identified in literature reviewed. They include organizational instability, poor access to training, inadequate medical supervision, shortages of volunteers, outdated equipment, extended transport times and poor communications. Levels of certification for rural North Dakota were quantified at: EMT-Basic, 49%; EMT-Intermediate, 9%; EMT-Paramedic, 9%; and all other certifications or designations, 33%.

This article provides important insights into the challenges of providing EMS in a rural setting. It identifies the organizational, financial and personnel problems closely associated with these challenges, enabling solutions to be crafted.

Commission on Emergency Medical Services

The State of California EMS Authority (Commission on Emergency Medical Services, 1999) addresses improvement of EMS program delivery. One section, titled *Improve Rural EMS Vision Subcommittee #7*, provides a comprehensive plan for improving rural EMS in California. Their recommendations included developing training outreach programs to assist volunteers with access to critical training, continuing the practice of federal and state EMS offices developing and distributing EMS public information to local providers at no cost, streamlining the processes for extending individual's scope of practice, and streamlining the process for out of state accreditation.

Their final recommendations in the funding section recognize the importance of funding to maintaining quality rural EMS, and the effect of the shrinking levels of financial assistance and service reimbursement from governmental agencies.

Improve Rural EMS Vision Subcommittee #7 provides the results of focus committees seeking solutions to the problems faced by rural EMS. Many of the suggestions apply directly to this research project in the area of program improvement. The material addresses concerns associated with research question two. Research questions one, three, and four are not addressed.

OAR Division 35

Oregon Administrative Rules (OAR's) (2002) contains the basis for prehospital emergency medical responder certifications and supervision in the State of Oregon. The areas pertinent to this document are 847-035-0001 (Definitions), and 847-035-0030 (Scope of Practice). Many of the definitions inserted in this research paper will come from this document. The document also contains material relating directly to the duties and responsibilities of the variously identified certifications.

OARs provides the definitions required to complete the research needed to answer research questions one and two. The document also provides the legal parameters within which an EMS program must operate in the State of Oregon.

Executive Fire Officer Program Research Papers

The one EFOP research paper that was in its complete format at the NFA Learning Center Library that had direct bearing on the subject being researched in this paper was outside the preferred age parameter as stated in the Applied Research Project Guidelines (revised October, 2001). However, it included important information still valid in today's world.

How to bring a Paramedic Program to a Small Fire Department

This paper was researched and written by Mitchell R. Waite, a Fire Marshal/EMT-Paramedic Coordinator with the Wisconsin Rapids Fire Department (WRFD) in the State of Wisconsin.

Waite (1996) conducted a research study on establishing a paramedic program in the WRFD. Several differences that exist in the basis of the research resulted in assumptions that do not apply to the Mist-Birkenfeld Rural Fire Protection District. First, the Wisconsin Rapids Fire Department had been a fully paid department since 1920 (pg. 11). Beginning with a fully paid staff eliminates many of the cost issues in the question of whether to provide ALS in the community.

However, Waite's processes and methodology were of great value. The research project provided a great deal of information on cost development and financing options. The costing template that was included could be modified for use in *Determining the Level of Emergency Medical Service in the Mist-Birkenfeld Rural Fire Protection District*. The materials applied directly to research question two.

Summary

UPEMS (2002) was an in depth study of rural EMS in the State of Michigan. The key findings, in order of priority, were personnel issues, financial issues, training issues and communication issues. The study portrays rural EMS in Michigan much the same as that experienced in rural Oregon. UP-EMS study provides many valuable insights into the makeup of a rural EMS program, and into the issues that matter most to the rural personnel who deliver the service to the public, addressing research question 2 indirectly.

NRHA (2002) provided much meaningful information. The special health care problems faced by rural and frontier populations was the focus of this document. Information provided in this study was important because it goes right to the heart of the need for improvement in rural EMS. The descriptions of rural health issues read as a list of focal points for EMS refinement for rural areas. Many of the issues are socio-economic in nature that will require political solutions as well as focused resources and training. The material provides baseline information relating to research questions one and three.

Dr. Rodenberg (2002a) asks whether or not there are too many Paramedics in the world sets the pace for the rest of the material contained in the three issues of JEMS On-line. His logical, matter of fact approach in questioning long held traditions regarding EMS was both refreshing and though provoking. Dr. Rodenberg questions several basic EMS assumptions in his column and suggests that adjustment of the customary concepts of EMS levels of service is not only coming but indeed is inevitable. There was a substantial case presented for improving and broadening BLS and ILS skills rather than stepping directly to ALS. If that occurs, Mist-Birkenfeld RFPD will be able to provide some of the ALS treatments and medications as a means of improving the quality of EMS available to the citizens of the fire district. The issues discussed by Rodenberg bear directly on program improvement potential in research question 2.

NCSL (2000) describes the dynamics of aging populations, poverty, lack of profit potential, and over-work as they apply to rural EMS. These are the same dynamics seen locally. The research information presented applies directly to research question two, addressing the potential for improvement of EMS program service and delivery in the rural environment. The paper was particularly concerned with the ability of rural EMS to

maintain its effectiveness in this environment. Suggested improvement strategies are designed to provide alternative program funding and to purchase equipment to enhance program efficiency. One strategy in particular suggests expansion of the traditional emergency medical role of EMTs to include providing non-emergency medical services in the community as a means of providing financial stability. This document was important because it was the only literature obtained that treats directly with financial cause and effect. Consequently, the problem of finance was central to the paper. The problem of finance is also central to the question of improvement of EMS service and delivery in the rural environment. The paper identifies rural funding issues and lack of profit potential in providing EMS transports.

The University of North Dakota (2002) describes EMS as playing a crucial health care role in rural and frontier areas. The document goes on to identify recruitment and retention, as the largest problems facing EMS in rural communities. This article directly addresses program improvement potential, an element of research question two.

UND (2000b) provides direct confirmation that personnel and financial concerns top the list for EMS at the squad level. This article directly addresses program improvement potential, an element of research question two.

Irwin (2001) addresses two of the base problems identified with rural fire districts, which are recruitment of quality volunteers and retention of trained and qualified personnel. The quality of a fire district's EMS program depends on keeping these experienced and knowledgeable people on your roster. They are what make it possible for the district to carry forward its mission. This article directly addresses program improvement potential, an element of research question two.

McDowell (2001) makes some important points that go to the heart of creating, improving and maintaining a high quality volunteer roster. Recruiting and training good people and then retaining them is critical to a quality EMS program. The material directly addresses research question two in identifying potential means for EMS program improvement.

NASEMSD (2000) provides a view of rural EMS problems from the top state EMS officials. The document reduced almost everything down to long term funding as the major problem and the major fix for the problem is identified as development of a long term funding strategy. Research question two was addressed in terms of program improvement. Questions one, three, and four were not addressed.

UND (2000a) provides baseline information on rural EMS challenges and concerns. This document provides a clear statement of precisely what makes EMS in the rural setting problematic. Material was also included regarding the effect of population migrations from urban areas to rural areas on EMS program expectations. The reasons stated resonate strongly with rural EMS providers nationwide. Research questions two, three, and four are addressed.

CEMS (1999) addresses EMS program issues at a state government level. Outreach training programs, streamlining the accreditation processes, and streamlining the process for changes to EMT's scopes of practice all provide opportunities to improve local EMS programs. These are issues relating to research question two.

The OARs (2002) form the baseline for a practicing prehospital emergency medical responder. Each supported certification level is considered a *level of patient care*, defining the limits of care, which can be delivered by a technician certified at each

level. These limits become very important when considering ways or means to improve EMS service in the State of Oregon. The OARs address research questions one and two.

Designing and implementing an ALS program in Wisconsin Rapids required much of the same work in planning, costing and researching as was necessary in the M-B RFPD. The processes were similar but the base problem was different. In the case of Wisconsin Rapids, career personnel were in place, training them to ALS and providing the equipment was what was needed. For M-B RFPD, equipment can be obtained and the apparatus already exists (Waite, 1996). It is obtaining and supporting career ALS personnel in a volunteer district that is the major problem (See Appendices M and N). Many of the processes identified were helpful in developing answers for research question two.

PROCEDURES

Definition of Terms

1. "Mist Birkenfeld Rural Fire Protection District" (Mist-Birkenfeld RFPD or M-B RFPD) means a local government entity organized as a rural fire district. The district provides Fire Suppression, Rescue and Search & Rescue services to 135 square miles and EMS services to about 165 square miles in western Columbia County in the State of Oregon. The area served is considered rural/frontier in nature, and has no cities incorporated within its boundaries.
2. "Emergency Care" as defined in ORS 682.023(5) means the performance of acts or procedures under emergency conditions in the observation, care and counsel of the ill, injured or disabled; in the administration of care or medications as prescribed by a licensed physician, insofar as any of these acts

is based upon knowledge and application of the principles of biological, physical and social science as required by a completed course utilizing an approved curriculum in prehospital emergency care. However, "emergency care" does not include acts of medical diagnosis or prescription of therapeutic corrective measures.

3. "EMS: Emergency Medical Services", a descriptive term referring to an organized program designed to provide pre-hospital emergency medical services directly to the public at the location of the emergency incidence.
4. "BLS: Basis Life Support" means a level of EMS that includes using all basic life support skills, procedures or protocols contained in either the First Responder scope of practice or the EMT-Basic scope of practice; may also be used to describe an EMS program supporting only Basic Life Support EMS (OARs, 2002).
5. "ILS: Intermediate Life Support" means a level of EMS that includes use of all basic life support and intermediate life support skills, procedures or protocols contained in the EMT-B and EMT-I scope of; may also be used to describe an EMS program that provides Intermediate Life Support EMS (OARs, 2002).
6. "ALS: Advanced Life Support" means a level of EMS that includes use of all intermediate life support and all advanced life support skills, procedures or protocols contained in the EMT-I and EMT-P scope of practice; may also be used to describe an EMS program that provides Advanced Life Support EMS (OARs, 2002).

7. "Section" means the Emergency Services and Trauma Systems Section of the Office of Public Health Systems of the Oregon Department of Human Resources (OARs, 2002).
8. "Emergency Medical Technician-Basic (EMT-Basic or EMT-B)" means a person certified under ORS Chapter 682 and in good standing with the Section, who has completed an EMT-Basic course a prescribed by OAR 333, Division 265, and is certified by the Section (OARs, 2002).
9. "Emergency Medical Technician-Intermediate (EMT-Intermediate or EMT-I)" means a person certified under ORS Chapter 682 and in good standing with the Section, who has completed an EMT-Intermediate course a prescribed by OAR 333, Division 265, and is certified by the Section (OARs, 2002).
10. "Emergency Medical Technician-Paramedic (EMT-Paramedic or EMT-P)" means a person certified under ORS Chapter 682 and in good standing with the Section, who has completed an EMT-Paramedic course a prescribed by OAR 333, Division 265, and is certified by the Section (OARs, 2002).
11. "In Good Standing" means a person who is currently certified or licensed, who does not have any restrictions placed on their certificate or license, or who is not on probation with the certifying or licensing agency for any reason (OARs, 2002).
12. "Scope of Practice" means the maximum level or emergency and non-emergency care that an EMT or First Responder may provide as defined in OAR 847-035-0030 (OARs, 2002).

13. "Standing Orders" means the written detailed procedures for medical or trauma emergencies and non-emergency care to be performed by an EMT or First Responder issued by the supervising physician commensurate with the scope of practice and level of certification of the EMT or First Responder (OARs, 2002).
14. "Critical EMS Call" means an EMS emergency call for service originating in the Mist-Birkenfeld Rural Fire District Ambulance Service Area that requires advance life support mutual aid or requires the activation of Life-Flight.

The desired outcome of this research was to determine the level of emergency medical service the residents of Mist-Birkenfeld Rural Fire Protection District would be willing to support. The research methodology was action research used to determine the experienced need for each level of EMS, to identify options for the fire district to improve the district's EMS level of service, to determine which of those options the residents of the fire district support, and to determine the level of satisfaction with available EMS in the fire district.

All research information taken from on-line sources was obtained from computers located at Mist-Birkenfeld Rural Fire Protection District, 12525 Highway 202, Mist, Oregon (M-B RFPD). All written research information was obtained from the National Fire Academy (NFA) Learning Resource Center LRC, located in Emmitsburg, Maryland, and directly from publications located in the library of M-B RFPD. The surveys described as used in conducting this research were conducted from M-B RFPD using the U. S. Postal Service during the months of October and November 2002.

Research was conducted using surveys and literature review to determine what level of EMS the citizens of the Mist-Birkenfeld community would support. Early in the process, during preliminary informal interviews, the researcher determined that a significant number of the general population of the fire district are unsure of the level of EMS they currently received and have no idea what the differences are between basic, intermediate and advanced life support service. There was no shared understanding of the options that are available or of the ultimate cost of those options. In order to obtain a meaningful answer to the question of EMS level of service it was necessary to first educate the respondents. An educational flyer was created for that purpose, enclosed as a preface to the Emergency Medical Service Level Survey to be distributed to the community during the month of November 2002.

Historical EMS Response Information (Research Question One)

The first information developed was historical documentation of the number of emergency medical calls for service listed in terms of the level of service required. The statistical report reviewed all available response records for the seven-year period beginning January 1, 1996 and ending November 30, 2002, determining the total number of EMS calls for service, the number of EMS calls that resulted in transports and then breaking them down to level of service required or provided. Any transport where either ALS mutual aid or Life-Flight was used was considered a critical call, requiring resources from outside the district to mitigate. The study also determined how many deaths in the field were experienced during the study (trauma and other) and each was studied to determine if ALS procedures would have prevented the loss of life. Finally, each EMS

transport was checked to see if ALS techniques would have benefited the patient in any way.

Resulting information was used to develop a statement of historical need in the form of research findings. Historical need was determined by comparing the cases where ALS would have saved a life, would have been required for proper patient care, or would have benefited the patient with the total number of patients transported. The information from this report will also be used to generate general information for use in developing the educational flyer to be distributed with the Emergency Medical Service Level Survey.

EMS Program Survey (Research Question Two)

To fully understand what options are available and the resource cost of those options a survey was created and distributed to 12 local area fire districts and an additional 13 fire districts located in northwest Oregon of similar size and make up, selected in the order they appeared in the Oregon Fire Chief's Association Membership Directory. Approximately 80 of the 346 districts appearing met the above conditions for inclusion. The purpose of this survey was to obtain service level and cost information for each district's EMS program as well as to identify personnel available, response times and call volume for profile comparison. Response was phenomenal with 22 of 25 surveys returned. A sample Program Survey is included in Appendix G.

Information from the returned Program Surveys was first split out to represent the service level of the responding districts and then entered on to a spreadsheet in matrix fashion. The four resulting data matrices or data groups (*all districts*, *BLS districts*, *ILS districts* and *ALS districts*) can then be directly compared. The first information

displayed (section I, question 1) in the totals row for each of the service levels was the number of responders reporting in that level of service, with a percentage just beneath the number. The percentage figures are obtained by dividing the number of responders for that level by the total number of responding districts and converting to a percentage and represent what portion of the total responding districts was represented in that data group. Data obtained from this survey was used to develop the options for research question two and to develop the educational flyer distributed with the Emergency Medical Service Level Survey.

EMS Program Survey, Section I

Section I of the Program Survey elicits information on the responding district's highest level of EMS available, the percentage of time that it was available at that level, how many incidents can be supported at that level, and whether that level of service was available through mutual aid. The primary information for this section was what level of EMS the district provided. This information was used as the primary parameter for data sorting and display. Questions two through four of this section determine the depth of available resources for comparative purposes.

Question number two of Section I determines how much of the time the reporting district can operate at their maximum EMS level. Similar to a "duty cycle" rating for rated equipment, the rating was listed as a percentage. The percentage was calculated for all data groups by totaling the percentages reported and dividing by the number of responses included in the group. The resulting number was the average percentage that the reporting districts for the data group can provide service at the group level (ALS, ILS, BLS).

Section I, question three, determines the depth of available personnel to support the reporting district's maximum EMS service level. This information indicates the strength of the district's EMS program, and, particularly for volunteer districts, what level of response can be generated by multiple alarms. The result listed in the total row was a number that was obtained by averaging the responses of the group for this question, representing the average number of responses the group can support at the reported EMS level of service.

Section I, question 4, was a "yes" or "no" choice indicating whether the fire district reporting was able to obtain EMS mutual aid at the same level as the districts reported maximum EMS service level. Again, this question goes to the depth of total available resources at that service level for purposes of comparison. The data was tabulated by determining the percentage of "yes" answers for that question and for that EMS service level and displayed in the totals row for the group.

EMS Program Survey, Section II:

Section II of the survey determines the responding district's response times to EMS incidents, the response time of same level mutual aid companies, and whether the district operated under an organized Multiple Patient Protocol or Multiple Casualty Incident Protocol. This section will provide comparative information that reflects the size of the district, its location in a rural or urban setting, and allows correlation of the effects of different personnel mixes (determined in the next section). This data was important in order to determine a response pattern for the surveyed district for comparison and to determine if there are distinct patterns for districts providing like services.

Section II, question one, was the primary question for this section, determining the responding district's average response time to an EMS incident (90% of the time). Response time, especially for volunteer districts, indicates the size and nature of the host community the distance personnel live from the responding station. A district with a station located in a small town was more likely to get a faster response time than one located in a rural or frontier community where personnel may be located several minutes from the station. The data was summed and divided to determine an average for that question and that group. The result was located in the totals row for the group.

Section II, question two, asks about the average response time for the closest mutual aid district. The importance of the question echoes that of question one, and will address the issues of population density in terms of how close together districts are in the area. The data was summed and divided to determine an average for that question and that group. The result was located in the totals row for the group.

Section II, question three, asks whether the district operates under an organized protocol for a major EMS incident. The goal of the question was to determine the level of mutual planning and cooperation that exists in the reporting district's area. The data was tabulated by determining the percentage of *yes* answers for that question and for that EMS service level and displayed in the totals row for the group.

EMS Program Survey, Section III:

Section III determines the personnel mix for the responding district and determines the cost of supporting paid EMS staff. In creating the options to be included in the EMS Level Survey, it was critical to identify personnel mixes that perform well in

rural areas. It was also critical to determine what the costs of maintaining paid EMS staff are for other districts to help determine the costs of each option.

Section III, question one, allows the responder to divide EMS personnel according to level of certification. The goal of this question was to determine the availability of trained EMS personnel at the various levels for each data group for comparison within the group as well as with the other groups. The data for each answer block (ALS, ILS, BLS) was summed and divided individually to determine an average for each answer block of the question for that group. The results were listed in the totals row for the group.

Section III, question two, was a gateway question allowing those districts that do not support paid staff for EMS to go on to the next section. The only data that was extracted was the percentage of reporting districts that support paid staff. The data was tabulated by determining the percentage of *yes* answers for that question and for that EMS service level and displayed in the totals row for the group.

Section III, question 3, asks about the percentage of personnel that are full time paid staff. This question addresses the career/volunteer mix of the responding district and was listed in the totals row for the group as a percentage of personnel that are full time paid. The percentage was calculated by totaling the percentages reported and dividing by the number of responses included in the group.

Section III, question 4, asks about the percentage of personnel that are part time paid staff. This question addresses the career/volunteer mix of the responding district and was listed in the totals row for the group as a percentage of personnel that are part time

paid. The percentage was calculated by totaling the percentages reported and dividing by the number of responses included in the group.

Section III, question five, establishes the entry-level salary for an EMS employee for the reporting district. This information was key to determining the cost of the options to be developed in the Emergency Medical Service Level Survey. The data was summed and the sum divided to produce an average for the data group. The average was displayed in the totals row for the group, and represents the average salary for an entry-level EMS employee.

Section III, question six, establishes the current average EMS officer's salary for the reporting district. This information was key to determining the cost of the options to be developed in the Emergency Medical Service Level Survey. The data was summed and the sum divided to produce an average for the data group. The average was displayed in the totals row for the group, and represents the average salary for an EMS officer.

Section III, question seven, establishes the current average annual cost to the reporting district to support one full time paid EMS staff person, including salary, training taxes, retirement and benefits. This information was key to determining the cost of the options to be developed in the Emergency Medical Service Level Survey. The data was summed and the sum divided to produce an average for the data group. The average was displayed in the totals row for the group, and represents the total average cost to a district in this data group of a full time paid EMS employee.

<u>EMS Program Survey, Section IV:</u>

Section IV focuses on the volunteer element of the personnel mix, and asks for the percentage of volunteer EMS personnel as a part of all EMS personnel, requesting information on any incentive plans for their volunteers, and determining what the cost to the responding district was to support a single volunteer. Incentive programs are an important part of the rural fire department's efforts to retain personnel. One of the options the researcher was researching was to maintain the current level of service, requiring maximum retention efforts by district management.

EMS Program Survey, Section V:

Section V determines the effective size of the responding fire district by documenting call volume, the impact of EMS on total activity, total population served, size in square miles of area where EMS coverage was provided and number of incorporated cities. The section provides the best comparative information for the responding district's emergency response footprint, allowing the researcher to focus first on those districts, which most closely resemble M-B RFPD.

EMS Program Survey, Applying the Data

Resulting EMS Program Survey data was used to determine the numbers of districts providing BLS service, ILS service, and ALS service; to determine average costs for personnel for each level of provider, and to set up comparative tools to illustrate patterns, trends or anomalies among those districts responding.

Personnel costs were charted and compared with personnel costs generated in the June 2000 Fire Chief's report. The cost estimate for providing one EMT Paramedic was determined by the higher of the internal estimate and the average of the reported costs.

Specific tools used for comparison included charts depicting, at a minimum, service level distribution, population and district size, volunteer personnel vs. career personnel (all districts), percent of personnel by district service level, response time comparison in minutes, annual number of responses by service level, certification level of EMTs by level of service, volunteers as a percent of district population, and population densities by service level.

Fire Chief's Report, June 2000

Additional information regarding potential EMS service level options was developed from the documents contained in the M-B RFPD Fire Chief's Report dated June 27, 2000 (See Appendix M). The subject of this report was a proposal from Metro-West Ambulance to provide ALS service in the Mist-Birkenfeld RFPD. Information contained in this report was evaluated and updated if necessary to ensure that it was current, and then considered with information developed through the EMS Program survey to develop the service level options to be included in the Emergency Medical Service Level Survey.

Emergency Medical Service Level Survey: (Research questions 3 and 4)

Determining the answers to research questions 3 and 4 required the creation of an Emergency Medical Service Level Survey (See Appendix J) designed to be distributed in the community served by the fire district. Because of the size of the community, it was decided to send the survey to each household in the fire district by bulk mail. This required a mailing of 287 packets. The limitations of this kind of distribution method are

that the mail is not always delivered to every address, mail may be delivered to addresses where no one is in residence, and that bulk mailed information is not always read. Citizens often have told fire district staff that bulk mail is routinely thrown away without even looking to see where it was from. Due to these limitations, the district expects about 60% of the packets to be received and read and about 40% of those read was completed and returned to the fire district. The fire district's experienced rate of return for surveys of any type was about 25% return of total sent.

Because we expected the return by mail to be limited, we also kept a ready supply of survey packets at the reception counter at the fire district main station business office. Citizens who visited were asked if they had received the material and if they had received it, had they completed and returned the survey. If the answer was *no* for either question they were offered the opportunity to receive and complete on of the counter survey packets.

As noted above, it was discovered that the community members did not have sufficient background knowledge of the issue, especially the options available and the cost in real terms of those options. To make the research meaningful to the fire district the community must receive the requisite information in a form that they could understand and assimilate. An educational letter was developed to accompany the survey when the survey was distributed. The letter introduced the reason for the survey and its importance to the community. Four levels of emergency medical service options was presented as options and described in detail. Additional background material was added with a final note explaining that the fire district wishes to give the community an opportunity to voice their preferences (Appendix B).

The choices outlined in the letter, and echoed in the survey (See Appendix J) were developed using costs developed internally by fire district staff and by considering information obtained directly from the earlier EMS Program Survey that had been distributed to local and regional to EMS providers.

Emergency Medical Service Level Survey Question, Number One:

Question one of the Emergency Medical Service Level Survey (See Appendix J) attempts to validate the educational effect of the letter to the community. One of the points of the letter was to explain that the highest level of EMS currently received in the fire district was *Intermediate Life Support* (or *Basic Life Support* when ILS was not available). Question one determined what the responding person understood the level of care to be, providing us feed back on how well out educational efforts performed. The goal was to reach all of those residents unaware of the information needed to meaningfully respond to this survey. The number of correct answers received on the survey was determined by adding the ILS responses and the BLS responses. Dividing the number of correct responses by the total number of responses and converting the result to a percentage determines the educational impact of the letter. The resulting percentage had a one to one correlation to the educational impact, with 100% being the maximum obtainable impact.

Emergency Medical Service Level Survey, Question Number Two:

Question two of the survey (Appendix J) produces information required to answer research question four, *What is the general level of satisfaction of the community with the currently available EMS?* The goal was to determine directly from the citizens what their level of satisfaction was with the current level of EMS available in the fire district. This

information was critical to developing a plan for the future of EMS in the district. Additional information for this question was provided by survey questions four and five. Counting every yes vote and dividing that number by the total number of responses tabulated the responses. The resulting number was converted to a percentage, indicating the percentage of responders satisfied with the current EMS level of service. The percentage had a one to one correlation to the level of satisfaction, with 100% being the maximum attainable satisfaction level.

Emergency Medical Service Level Survey, Question Number Three:

Question three of the survey (Appendix J), *What level of EMS are the residents of fire district willing to support*, provided the households an opportunity to choose the level of service they desired and to choose the path to take in reaching the goal. The goal of the question was to obtain a clear indication of the level of service preferable and supportable by the residents of the district. Four choices were offered in order of most expensive to least expensive. The option cost was expressed in terms of tax dollars for each option.

The first choice offered was to provide full time, 24 hour per day, seven day per week ALS emergency medical program. The educational letter explained the option and the costs attached to the option. After looking at the equipment, supplies and training costs, the district decided that it could absorb these expenses without additional cost to the taxpayer (See Appendix N). The cost of providing this option was considered to be the cost of hiring and maintaining 3.5 personnel trained and certified to perform at the Paramedic level at approximately $60,000 each, or $210,000 annually. The costs of providing these personnel were determined from research performed by district staff and

by the results of the data developed in section III of the EMS Program Survey. Cost in terms of taxes was determined to be $1.63 per $1000 of property valuation, or $163 per year on a $100,000 home (See Appendix N).

The second option was offered as a lower cost means of providing a limited ALS emergency medical program to the citizens of the fire district. The option would provide one Paramedic staffed full time, providing ALS service about 28.6% of the time. Again, after looking at the equipment, supplies and training costs, the district decided that it could absorb these expenses without additional cost to the taxpayer (see Appendix N). The option was offered with the caveat that in reality this employee would end up putting in a lot of over-time as the only Paramedic in district, and that would likely run up the cost by about 50% to $90,000. The cost of providing these personnel were determined from research performed by district staff and by the results of the data developed in section III of the EMS Program Survey. Cost in terms of taxes was determined to be $.70 per $1000 of property valuation, or $70 per year on a $100,000 home (See Appendix N).

The third choice offered was to provide ALS emergency medical service through attrition. This option would replace the existing paid personnel, the Fire Chief and the Assistant Fire Chief, with personnel trained as Paramedics when they leave the job or retire. The projected time-line for this to occur was seven to ten years. As above, after looking at the equipment, supplies and training costs, the district decided that it could absorb these expenses without additional cost to the taxpayer (see Appendix N). The projected cost to require addition of Paramedic certification to the requirements of these positions was $15,000 each or a total of $30,000 annually. Cost in terms of taxes was

determined to be $.20 per $1000 of property valuation, or $20 per year on a $100,000 home (See Appendix N).

The fourth option was for the level of EMS provided in the fire district to remain unchanged, continuing to provide an intermediate life support level of service into the foreseeable future. This option was supportable by the district with no foreseeable increase in cost to the district or to the taxpayers.

Counting the total number of positive indications for each option, dividing each by the total number of responses, and converting each result to a percentage tabulated the data. For each option, there was a one to one correlation of the resulting percentage to the value placed by the community on the option, with 100% being the maximum total possible.

Emergency Medical Service Level Survey, Question Numbers Four & Five:

Questions four and five on the Emergency Medical Service Level Survey (Appendix J) are indirectly related to research question four. They are intended to determine whether the respondent had used our EMS program, and how they would rate the service. The goal of questions four and five was to provide a means of determining if a difference exists between the value assigned based on actual experience with the district's EMS and the value perceived by those who have not had direct experience. This information was important in that it indicates whether use of the current EMS program resulted in a more positive rating, a more negative rating or the same rating. Improvements to the program can be more appropriately targeted using the results of these questions.

For question four, the choices are *yes* and *no*. The data obtained from question number five was split, with the data produced by the *yes* votes from question four tabulated separately from the data produced by the *no* votes. Each resulting group then was tabulated by counting the total number of positive indications for each rating, dividing each by the total number of responses, and converting each result to a percentage. For each rating, there was a one to one correlation of the resulting percentage to the rating indicated by the community on the survey, with 100% being the maximum total possible. The results from each group of data can then be compared to determine if differences do exist between the perceived value of service of those who have used the EMS program and those who have not.

Question 5 asked the responder to rate the EMS program of the fire district. The choices provided were *Excellent, Very Good, Good, Fair* and *Poor*. The number of times each choice was marked were summed and converted to percentages of the total. These percentages represent the level of satisfaction of the community with the current EMS program.

Emergency Medical Service Level Survey, Comments Section:

The "comments" section (See Appendix L) on the back of the form was intended to provide the respondent with an unstructured forum to express opinions or to explain concerns. The section was used several times. Because the forum was unstructured, it was not possible to form generalizations regarding the comments, except as to whether the comment was repeated, potentially identifying a common theme. Any comment given more than once was ranked according to the number of times repeated, with those repeated most often ranked higher than those less often repeated.

Moving to Conclusion

Results

The data generated by the procedures noted above was listed and interpreted in the *Results* section. The data was organized according to which research question it addresses, and the research questions was arranged in the order they were introduced. Raw data was listed in each section first, followed by interpretations and correlations. Data was searched for pertinent trends, patterns or anomalies that demonstrate important factors data that have bearing on the question. Conclusions may be listed if the conclusions can be supported solely by the data.

Discussion

Once data was derived into useful information, the information was expressed in the Discussion section, along with information developed from literature sources. In this section, information was used to create insight with which to answer the research questions posed in the introduction and to craft a solution for the problem, "The fire district does not know what level of EMS service the citizens of the district will support."

Recommendation

When discussion was finished, the solutions crafted were set down in the form of recommended actions. These actions are the culmination of the research process and represent the steps to be taken to solve the problem stated.

Assumptions and Limitations

There was an assumption that data generated in such places as Michigan, North Dakota and California are generally representative of data on rural EMS that can be

generated in most other parts of the nation. In doing cross comparisons between the data used and that available locally, the assumption appears to be generally true.

Use of State of Oregon Standards

The applicability of the results of the study may be slightly compromised in states that use different certification criteria, procedures, and levels of care (OARs, 2002).

EMS Program Survey

The survey sample size of 25 districts may reduce the impact of the survey results compared to a nationwide survey instrument. The make up of the sample was also limited to the northwest region of Oregon, limiting its applicability to EMS providers in other parts of the nation. However, for the purpose of collecting and applying data most useful to the Mist-Birkenfeld RFPD, the sample was of appropriate size and distribution.

Emergency Medical Service Level Survey

There was an automatic limitation built into the number of responses to be received. This was due to the process of sending one survey packet to each household using the bulk mail provision of the U.S. Post Office. Some households may contain one citizen; some may contain seven or eight. It was hoped that each response received would be representative of the feelings and beliefs of the entire household.

Available Time

There is limitation on the quantity of work that can be applied to the research project in that a time limit exists.

Nature of Research Subject

The nature of the subject, rural prehospital emergency medical level of care, applies a significant limitation on the amount of available literature.

Use of U.S. Postal Service Bulk Mailing

The limitations of this kind of distribution method are that the mail does not always get delivered to every address, mail may be delivered to addresses where no one is in residence, and that bulk mailed information is will not always be read. Citizens often have told fire district staff that bulk mail is routinely thrown away without even

looking to see where they are from. Due to these limitations, the district expects about 60% of the packets to be received and read and about 40% of those read was completed and returned to the fire district. The fire district's experienced rate of return for surveys of any type was about 25% return of total sent.

Rounding and Decimal Limits

Data was calculated using no limit on the number of decimal places of numbers. The data was displayed rounded to a maximum of two decimal places. For all practical purposes, this rounded figure represents an accurate depiction of the number for comparison to other, similarly rendered numbers in the document.

RESULTS

Results are presented as they apply to each of the four research questions.

Research Question One:

What is the average number of emergencies experienced in the fire district at the level of basic and intermediate life support and at the level of advanced life support?

Research question number one had a single purpose. That purpose was to determine, objectively, through examination of existing data, in terms of the patient, the potential impact of improving the Mist-Birkenfeld RFPD EMS program to an Advanced Life Support level of care. The historical records of Mist-Birkenfeld RFPD, located at the district offices at 12525 Highway 202, in Mist, Oregon, were studied over a 7-year period covering the calendar years of 1997 through 2001. Of special interest were critical calls (those which required ALS care through a mutual aid agreement or those that required to be flown by Life-Flight). The records of all of those patients who succumbed to injuries or illnesses in the fire district or while in a medical facility as a direct result of

those injuries or illnesses were also examined. EMS record examination was limited to information directly relating to the pertinent statistics.

EMS Statistics for Mist-Birkenfeld Rural Fire Protection District

EMS Division Chief Ann Berg was asked to provide EMS statistics going back five to ten years and including total annual calls, total annual EMS calls, total actual transports annually and total annual "critical EMS calls". The report that she completed covered almost seven years, beginning in January of 1996 and ending on November 30, 2002 (The report is reproduced in Appendix E). The data from this report directly addresses research question one, "What is the average number of emergencies experienced in the fire district at the level of basic and intermediate life support and at the level of advanced life support?" Data is incomplete for years prior to 1996 due to loss of files to flood waters (February 7-10, 1996). Data for 1996 were skewed due to the abnormally high response rate experienced during the flood and the recovery period immediately following. The data for 2002 were incomplete as an annual measure but provided a means of measuring the statistical trends as they extend into the 2002 calendar year. Because of these concerns, the study was limited to the complete and representative data reflecting the calendar years 1997 through 2001.

The relevant data from D.C. Berg's statistical report allows the district to determine the need for a higher level of EMS in the community, specifically advanced life support EMS. During the five-year period of the study the fire district averaged 149 calls for emergency medical service annually, resulting in an average of 60 patients transported annually. Using the five year statistics, EMS calls resulted in a 40% EMS transport rate, indicating that 60% of the patients contacted either elected not to go to the

hospital emergently or went by privately owned vehicle. Of those calls for service, critical calls averaged 3.8 per year, or about 2.56 percent of the total EMS calls for service. The EMS calls for service during that time made up 72% of the total calls for all emergencies (see Figure 1), which matches the

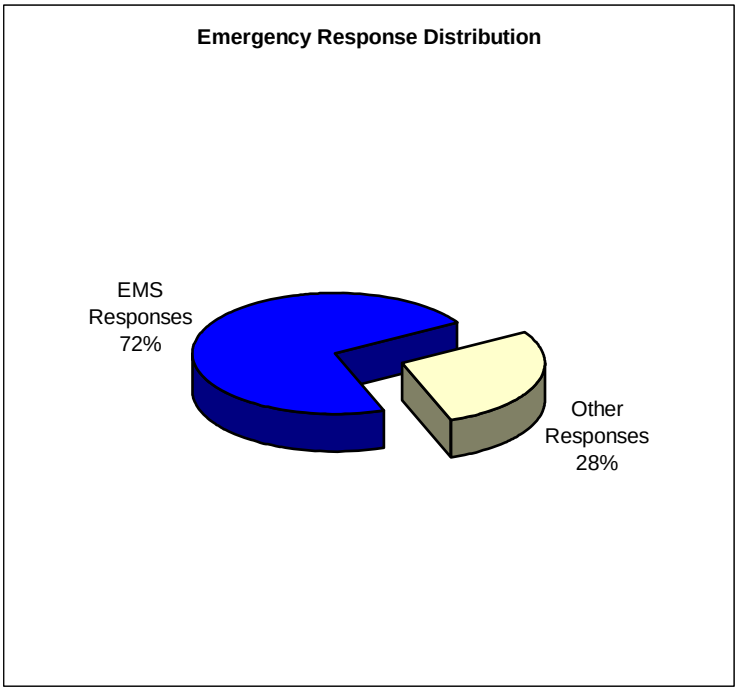


Figure 1

average percentage experienced by all providers surveyed in the EMS Program Survey. The average percentage for all ILS providers in the same survey was 69%, slightly lower than M-B RFPD's experienced rate.

Data trends could be identified for total emergency calls, for EMS calls, for EMS transports and for critical calls for years 1997 through 2001. Total for emergency service calls identified by D.C. Berg in her report increased at a rate of 2.64% per year, while calls for EMS increased at a rate of 2.08% per year. EMS transports to an Emergency Medical Facility were up 12.65% per year while during the same period the number of

critical calls declined by an average of 5% per year. Projected numbers for 2002 show a growth in total calls of less than 1%, no change in EMS calls, an increase in EMS transports of 8.64% and no change in the number of critical calls (4).

The last page of DC Berg's report includes the results from her research on deaths in the fire district where the fire district EMS system responded. During the five-year period studied, the district responded to ten patients who expired before, during or shortly after transport to a medical facility. According to the study, no patient deaths were attributable to lack of ALS patient care. In every case, ALS treatment would clearly not have changed the outcome.

However, 19 critical calls (3.8 per year) and 20 EMS patients that might have benefited from ALS techniques (4 per year) appeared on the third and fourth pages of the report (see Figure 1). Potential benefits identified included greater degree of patient stabilization, pain control and patient comfort level. (See figures 2 and 3)

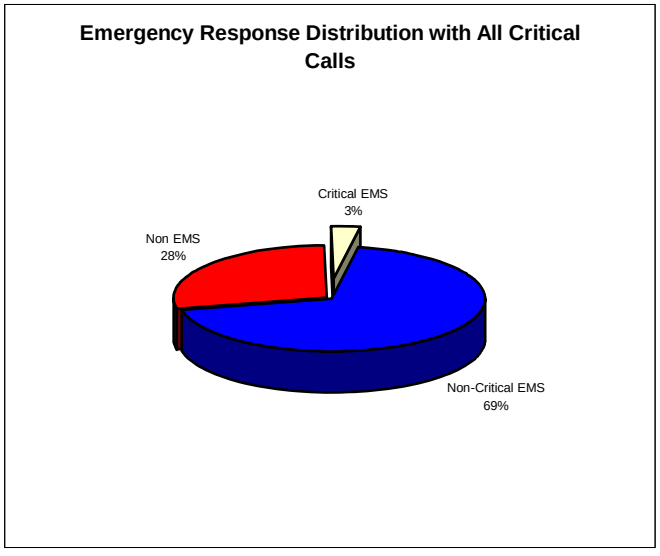


Figure 2

The potential need for advanced life support services in terms of critical calls was a rate of about 3.8 patients (2.56% of EMS calls) per year using the data described above (See figure 2). The rate was nearly double that, 7.4 per year (5%), if patients who would benefit in any way from application of ALS techniques (See Figure 3).

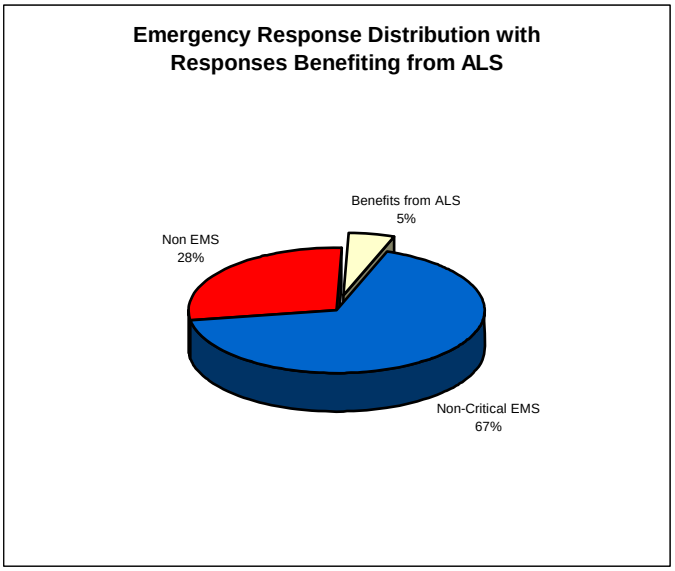


Figure 3

Findings Based on Research Question #1:

Finding #1: Based on DC Berg's report, there was no positive correlation between lives lost and lack of an ALS program.

Finding #2: Based upon the occurrence of critical calls, ALS techniques were necessary on an average of 2.5% of the emergency medical calls for service.

Finding #3: Based upon the number of patients who may have benefited from ALS medications or techniques, ALS techniques or medications may have benefited as many as an additional 2.7% of the patients on calls responded to during the period of the study.

Research Question Two:

What options exist that would result in EMS improvements in the Mist-Birkenfeld Rural Fire Protection District?

Research Question two was the most difficult question upon which to obtain meaningful results. Answering this question involved both internal fire district research (See Appendix M) and obtaining information from other established and operating districts in the local area or other regional fire districts of similar size or operating environment. The EMS Program Survey was developed for the purpose of reaching these other districts (See Appendix G).

Results of EMS Program Survey Data

An EMS Program Survey was conducted as detailed in the *Procedures* section. Data was collected and listed for analysis. Numerous charts depicting the data visually were created to illustrate the effect of the data when compared. The Raw data is available for inspection in Appendix I.

A Program Survey with resulting rough data inserted is included in Appendix H, along with a compilation of the detailed data. Details of the resulting data are listed below by service level and then by survey question.

All Providers Surveyed:

This section reviews the resulting data as an aggregate. The data was useful for research question two in that it was the source data in its raw form.

Section I:

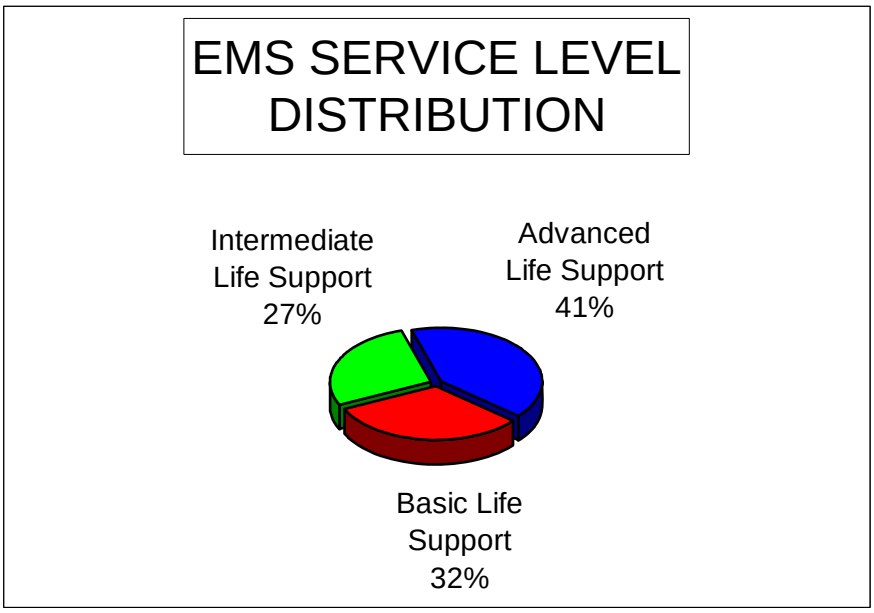


Figure 4

Of the 25 surveys mailed 22 (88%) were returned. Of the 22 districts seven reported as BLS (32%), six as ILS (27%), and nine as ALS (41%) (See Figure 4). Reporting districts had EMS available at or above their listed level of service an average of 99.7% of the time and were able to maintain their service during an average of 2.5 concurrent EMS calls. Mutual aid was available at their EMS service level 73% of the time (See Appendix G).

Section II.

The fire districts surveyed reported an initial response time of an average of 6.47 minutes. Mutual aid response times averaged 12.98 minutes (See Figure 5). These districts also reported that 73% operated under an established Multiple Patient Incident (MPI) protocol or an established Mass Casualty Incident (MCI) protocol or both (See Appendix I).

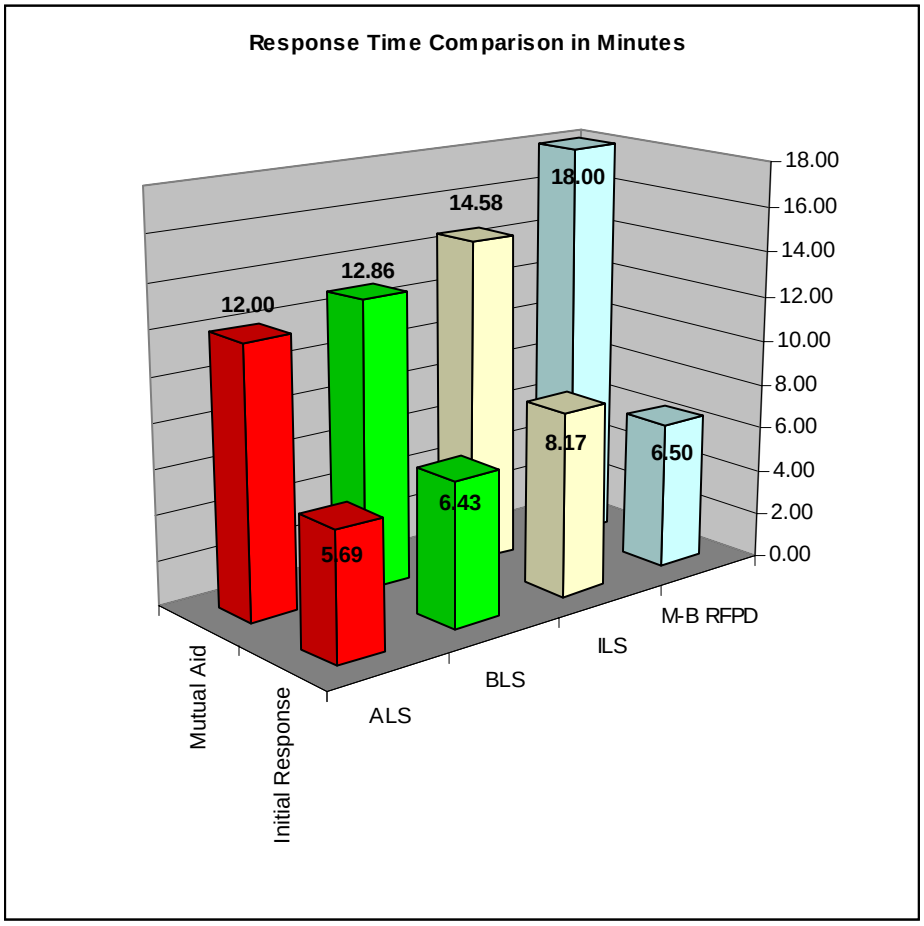


Figure 5

Section III:

Districts surveyed reported an average of 5.1 ALS personnel, an average of 2.8 ILS personnel, and an average of 12.8 BLS personnel. The same agencies reported that 55% supported full time paid EMS personnel and that an average of 43% of their personnel were full time staff. The average percentage of part time paid EMS staff supported was 1.7%. The average entry-level EMS salary provided by this group was $39,166, with EMS officer's salaries averaging $48,928. The surveyed districts reported

that the average total cost to support an EMS employee, including salary, benefits, and training, was $61,523 (See Appendix I).

Section IV:

Volunteer personnel made up an average of 68% of the responding EMS providers' total personnel roster (see Figure 6). An average of 59% of these districts reported the use of incentive programs to enhance retention. The average cost of a volunteer EMS provider at these districts was $1367 (See Appendix I).

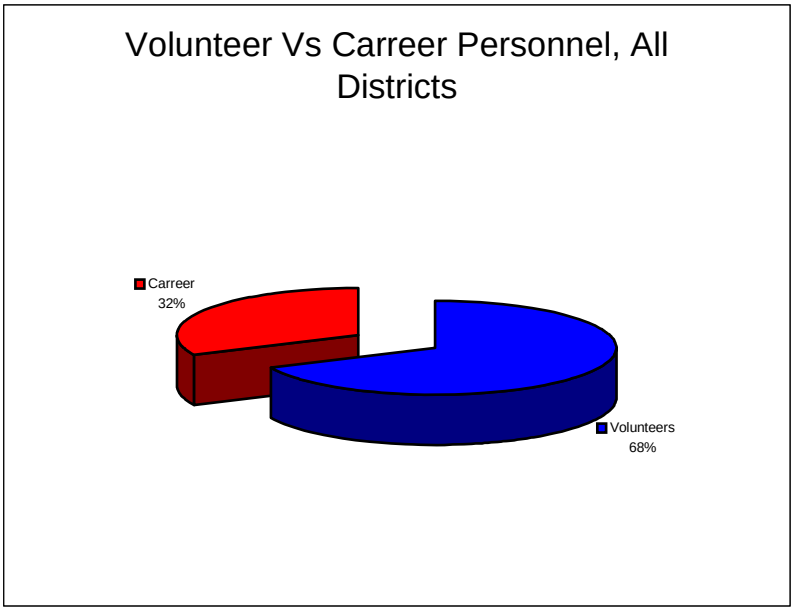


Figure 6

Section V:

An average number of 595 emergency responses were reported by all fire districts. Of those responses, 73% were EMS related. The average size of the resident population in the fire districts surveyed was 11473 persons residing in a fire district of an average size of 191.2 square miles. The average number of incorporated cities residing within the BLS districts surveyed was 1.0 (See Appendix I).

Basic Life Support Providers:

This section lists data pertaining only to BLS responding fire districts.

Section I:

Districts that normally provide BLS made up 32% of the fire districts sampled. These districts had BLS available an average of 99.7% of the time and were able to maintain their service during an average of three concurrent EMS calls. Mutual aid was available with at least a BLS level an average of 86% of the time (See Appendix I).

Section II:

The BLS fire districts surveyed reported an initial response time of an average of 6.43 minutes. Mutual aid response times averaged 12.86 minutes. These districts also reported that 43% operated under an established Multiple Patient Incident (MPI) protocol or an established Mass Casualty Incident (MCI) protocol or both (See Appendix I).

Section III:

BLS districts surveyed reported no ALS personnel, an average of one ILS employee, and an average of 17.4 BLS personnel. The same agencies reported no paid personnel, generating no data for paid staff costs (See Appendix I).

Section IV:

Volunteer personnel made up an average of 79% of the BLS providers' total personnel roster. Only an average of 14% of these districts reported the use of incentive programs to enhance retention. The average cost of a volunteer EMS provider at these districts was $614 (See Appendix I).

Section V:

An average number of 409 emergency responses were reported by BLS fire districts. Of those responses, 82% were EMS related. The average size of the resident population in the BLS fire districts surveyed was 8114 persons residing in a fire district of an average size of 363.3 square miles. Incorporated cities residing within the BLS districts surveyed average 0.6 in number (See Appendix I).

Intermediate Life Support Providers:

This section lists data pertaining only to ILS responding fire districts.

Section I:

Districts that normally provide ILS EMS made up 27% of the fire districts sampled. These districts had ILS available an average of 86% of the time and were able to maintain their service during an average of two concurrent EMS calls. Mutual aid was available with at least an ILS level 100% of the time for the sample group (See Appendix I).

Section II:

The BLS fire districts surveyed reported an initial response time of an average of 8.17 minutes. Mutual aid response times averaged 14.58 minutes. These districts also reported that 83% operated under an established Multiple Patient Incident (MPI) protocol or an established Mass Casualty Incident (MCI) protocol or both (See Appendix I).

Section III:

ILS districts surveyed reported an average of 2.5 ALS personnel, an average of 5.2 ILS personnel, and an average of 9.2 BLS personnel. The same agencies reported that 83% supported full time paid EMS personnel and that full time paid staff made up an

average of 7% their employees. This group supported no part time paid EMS personnel. The average entry-level EMS salary provided by this group was $34,572, with EMS officer's salaries averaging $37,800. The surveyed districts reported that the average total cost to support an EMS employee, including salary, benefits, and training, was $48,996 (See Appendix I).

Section IV:

Volunteer personnel made up an average of 94% of the ILS providers' total personnel roster. ILS districts reported an average of 83% employed the use of incentive programs to enhance volunteer retention. The average cost of a volunteer EMS provider at these districts was $1300 (See Appendix I).

Section V:

An average number of 235.3 emergency responses were reported by ILS fire districts. Of those responses, 69% were EMS related. The average size of the resident population in the ILS fire districts surveyed was 5758 persons residing in a fire district of an average size of 111.5 square miles. Incorporated cities residing within the ILS districts surveyed average 0.7 in number (See Appendix I).

Advanced Life Support Providers:

This section lists data pertaining only to ALS responding fire districts.

Section I:

Districts that normally provide ALS made up 41% of the fire districts sampled. These districts had ALS available an average of 85.5% of the time and were able to maintain their service during an average of 2.4 concurrent EMS calls. Mutual aid was available with at least an ALS level an average of 44% of the time (See Appendix I).

Section II:

The ALS fire districts surveyed reported an initial response time of an average of 5.69 minutes. Mutual aid response times averaged 12 minutes. These districts also reported that 89% operated under an established Multiple Patient Incident (MPI) protocol or an established Mass Casualty Incident (MCI) protocol or both (See Appendix I).

Section III:

ALS districts surveyed reported an average of 10.8 ALS personnel, an average of 2.9 ILS employee, and an average of 10.6 BLS personnel. The same agencies reported that 78% supported full time paid EMS personnel and that 68% of their personnel were full time paid. This group supported an average of 2% part time paid EMS personnel. The average entry-level EMS salary provided by this group was $40,479, with EMS officer's salaries averaging $50,783. The surveyed districts reported that the average total cost to support an EMS employee, including salary, benefits, and training, was $70,471 (See Appendix I).

Section IV:

Volunteer personnel made up an average of 43% of the BLS providers' total personnel roster. ALS districts report an average of 78% use incentive programs to enhance retention. The average cost of a volunteer EMS provider at these districts was $1687 (See Appendix I).

Section V:

An average number of 886 emergency responses were reported by ALS fire districts. Of those responses, 68% were EMS related. The average size of the resident population in the ALS fire districts surveyed was 15917 residing in a fire district of an

average size of 296 square miles. Incorporated cities residing within the districts surveyed average 1.6 in number (See Appendix I).

Significance

The data from this survey (See Appendix I) indicated that intermediate life districts make up the smallest percentage (27%) of the fire districts sampled, advanced life support services made up 41% of the total (by far the largest portion), and BLS providers represented 32% of the districts surveyed. ILS districts tend to have significantly longer response times for both initial response (8.17 minutes) and for mutual aid (12.86 minutes) than do ALS districts (5.69 minutes and 12 minutes, respectively). ILS providers rely on volunteers to a much higher degree than either the BLS or the ALS districts surveyed, with an average of 94% of their personnel being volunteers, compared to 79% for BLS and 43% for ALS districts. The average cost of one full time paid EMS employee, including training, retirement, benefits and salary for ILS providers was $48,996, compared to the cost to ALS districts of $70,471 (BLS districts reported no paid EMS employees) (See Appendix I).

The data showed the surveyed ILS providers are usually supported by a number of BLS personnel. The average number of ILS EMTs for this group was 5.2, supported by an average of 9.2 BLS EMTs and 2.5 ALS EMT's, resulting in an average of 31% of the available EMTs being ILS. BLS providers listed an average of one ILS EMT supporting an average of 17.4 BLS EMTs. The ALS providers reported an average of 10.6 ALS EMT's supported by an average of 2.9 ILS EMT's and 10.8 BLS EMTs, resulting in an average of 43% of available EMS personnel being ALS certified (See Appendix I).

ILS districts also tend to support a small core of paid staff (6.0% of total EMS personnel), usually EMT Intermediates who are supported by volunteers (94%of total EMS personnel). ALS districts average 57% of their personnel as paid supported by 43% who are volunteers. BLS districts reported 21% of their personnel as paid with 79% of their EMS force being volunteers (See Appendix I).

Differences again appeared when comparing the amount of funds invested per volunteer. BLS districts reported spending $614 per volunteer, ILS districts $1300, and ALS districts $1687 per volunteer. A sister question, "Do your volunteers receive an incentive for their participation," resulted in a positive response for 83% of ILS districts reporting, 78% of ALS districts and only 14% of BLS districts who reported (See Appendix I).

The call annual volume for ILS districts averages the lowest of the three surveyed groups, with 235.3 calls, representing 57.6% of the average call volume of BLS districts (363.3) and 26.6% of ALS average call volume (886.3). Predictably, the ILS districts surveyed also experienced the lowest annual number of EMS calls, with 162.4 EMS calls, representing 69% of call volume (See Appendix I).

The data showed a clear difference in the paid staff cost levels. ILS districts averaged $48,996 of total cost per paid employee with EMS responsibilities, while ALS districts averaged a cost of $67,913. The average cost of supporting a single volunteer was $1300 for ILS districts, compared to $614 for BLS providers and $1667 for ALS fire districts (See Appendix I).

Determination of Options for Research Question Two

There are actually five options that were identified as operationally achievable. Two of them, first identified in a June 2000 Fire Chief's Report (Appendix M), were so similar in financial and operational impact that they were considered, for the purposes of this study, to be substantially the same choice and were combined under option one in the survey, the option for a full time ALS program.

Option One: Full Time ALS Program

The first option, full-time ALS, was clearly necessary to include in the Emergency Medical Service Level Survey because it was specifically requested by citizens of the fire district (See Appendix A). As noted above, this option actually represented a fire district based program, internally managed and funded, and using district personnel to carry it forward, and a program based on ALS employees obtained from and maintained by a private ambulance company. Both programs provided a full-fledged ALS program for the fire district, with a paramedic available 24 hours per day, 7 days per week. Both had similar economic impacts and depended on volunteers to operate. The major difference between them was that one was an in-house program using fire district personnel and the other one used contract employees and an ALS program provided by a private ambulance company.

An in-depth study of the costs associated with embracing either of the programs identified in Fire Chief's report was completed and included with the report. The in-house program had a slight edge in that the district would retain rights to bill for EMS transports. Even though this proposal was made in June of 2000, the anticipated costs compared closely to those of an ALS program to be implemented in 2002. Even current

personnel costs seemed to be about the same as those projected in the June Fire Chief's Report (See Appendix M).

According to the report, the cost of the program (either of them) would result in a service cost increase of about $227,681. The only way to finance the program would be through increasing property tax revenues. In Oregon, due to the structure of the tax property tax codes, this means passing a "Local Option" tax, charged on top of the district's "Constitutional Rate" of $2.0875 per $1000 of property valuation (DOR, 2002). During fiscal 1999-2000, the tax rate produced for just this single change would produce an effective tax rate of $4.58 per $1000 of valuation, an increase of 120% (See Appendix N). Currently, due to increases in utility and commercial property in the district, the rate produced would be about $3.7175 per thousand, or about a 78% increase in property taxes in the district. Based upon those anticipated costs, an initial program cost was developed and the cost included with the option on the survey (See Appendix N).

Part Time ALS:

The third option identified as a potential place to start an ALS program, option two on the survey, was to provide a single full time paramedic. This option would provide ALS emergency medical service about 28% of the time. The cost to implement this option was expected to be about $90,000 annually (See Appendix N), resulting in the need for a local option tax at the rate of about $.70 per $1000 of valuation. This option would amount to a raise in district property taxes of about 33% (See Appendix N).

Strong points of the option included immediacy, lower cost, less complex financial and managerial issues, and less cultural impact than either of the full time ALS options.

Obvious drawbacks to this choice were apparent immediately. Scheduling for the needs of the district residents would be a nightmare, both for management and for staff, due to the expectation that will understandably develop that ALS care should have been available "when I had my heart attack". No matter how the EMT's time was scheduled, there would be emergencies where either the need or the expectation existed that a paramedic be on scene. One answer to the scheduling issue that many districts have taken was to "call back" a paramedic (in this case *the* paramedic) to respond with overtime pay. The option was studied with overtime in mind and approximate overtime costs factored in. The cost factor of overtime could equal an additional 50% for personnel expense, perhaps more, and may leave the paramedic chronically over tired and stressed. These conditions may bleed over into the employee's home life and the stress level rises again.

ALS Through Attrition:

The fourth option identified as a possibility, option three on the survey (see Appendix J), was proposed as a community-sponsored goal for the fire district (See Appendix A). This choice would provide ALS personnel as replacements for existing paid personnel as existing personnel leave the fire district's employment. This was a common sense approach, though not a quick fix. The current expectation was that seven to ten years would be required to accomplish the goal. Future legislative changes affecting the Oregon Public Employees Retirement System are certain, which could extend retirement age, thereby extending the time required to make this choice a reality.

Strong points for this approach include much lower cost, little cultural impact on district or community, allows time for planning, and it maintains the managerial integrity and continuity of the fire district without compromising the goal.

The cost to implement this option was expected to be approximately $30,000 annually, or an additional ten percent in taxes. The figure was based on the additional cost of an ALS EMT over a BLS EMT and was amortized using a seven-year program implementation date (See Appendix N).

No Change in Level of Service

The fifth option was to make no change in the EMS level of service (See Appendix J), maintaining the current tax rate and working for improvement within its structure. This choice was born out of the realization that the community may be unwilling or unable to afford any increase in property taxes at this time.

There was no financial impact for implementation of this option. However, in terms of patient care, the cost was clearly the lost opportunity to provide life saving ALS techniques when the alarm sounds and the call was one of those 3.8 true ALS emergencies annually that the district has experienced (See Appendix E). Additionally, opportunities are lost to provide therapeutic relief of pain and other symptoms through protocols available only to ALS personnel in Oregon currently (See Appendix C).

Findings Based on Research Question #2:

Finding #4: The options identified to be included in the Emergency Medical Service Level Survey were: *ALS available 24 hours/7 days per week* at a cost of $1.63 per $1000 valuation ($163 per year on a $100,000 home); *ALS available about 20% of the time* at a cost of $ .70 per $1000 valuation ($70 per year on a $100,000 home); ALS

available in 7 to 10 years through attrition at a cost of $ .20 per $1000 valuation ($20 per year on a $100,000 home); Continue *with ILS service that was now available* $ 0.00 (no change in property tax rate).

Research Question Three:

What level of EMS are the residents of fire district willing to support?

Having identified the options to be presented to the citizens of the district, the options were placed in survey form and presented via bulk mailing to each household in the fire district using the U.S. Postal Service.

Emergency Medical Service Level Survey

The Emergency Medical Service Level Survey (Appendix J) was designed to elicit meaningful information directly from the citizens of the fire district regarding their understanding of the service level issue, their choice of a service level option, their satisfaction with current EMS, whether they had ever used the service and how they would rate EMS in Mist-Birkenfeld RFPD. The Survey was sent out by mail to every address in the fire district along with the educational letter discussed earlier. The bulk mailing required 287 survey packets to be delivered on two mail routes. About 72 completed surveys were expected to be returned. The actual number of returned surveys was 57. Counter packets generated an additional 23 completed surveys for a total of 80. Our experienced return rate on the community Emergency Medical Service Level Survey was 28% (3% above the expected rate).

Questions number one and three of the Emergency Medical Service Level Survey are designed to address research question three. Questions two, four and five were designed to address research question four.

Results of Emergency Medical Service Level Survey Question Number One:

Question number one of the survey attempts to determine how effective the educational letter sent out with the survey was in educating the citizens about the current level of EMS received in the community. The number of correct responses on the survey, expressed as a percentage, determines the educational impact of the letter in the community. Of the 80 surveys returned, 99% (79) chose the appropriate level of service and 1% (1) had no mark to indicate a choice. There were no incorrect responses. (See Appendix J). The results indicate that all of those who responded and who may have lacked basic information read the cover letter thoroughly. The educational material contained in the survey cover letter provided the educational effect needed. Therefore, the level of confidence in the community's ability to make a meaningful, informed choice was very high.

Results of Emergency Medical Service Level Survey Question Number Three:

Question number three of the service level survey presented four service level options and asked the responder to choose the one that most fit their needs and desires. The results for the first option offered (24/7 ALS at a cost of and additional $1.63 per $1000 of property valuation): 8% of those responding chose this option (See Figure 7). Option two (ALS available 20% of time at a cost of $.70 per $1000 of property valuation, received 6% of the votes of respondents. The third option, ALS through attrition at a cost of $.20 per $1000 of property valuation, was the choice of 16% of those that returned surveys. The last option, no change and no additional cost, received the support of a whopping 70% of those surveyed (See Appendix J).

Full Time ALS:

Those surveyed chose the full ALS option about 8% of the time (See Figure 7). Comments in favor included “It was worth the expense”, “The community needs the service”, “This was a very isolated area, it was difficult to get help from outside”, and “We need the higher level of care”. Comments not in favor included “No, no, no, no change,” “Fire District costs are too high”, and “How many patients lost from lack of ALS? I checked the records. None.”

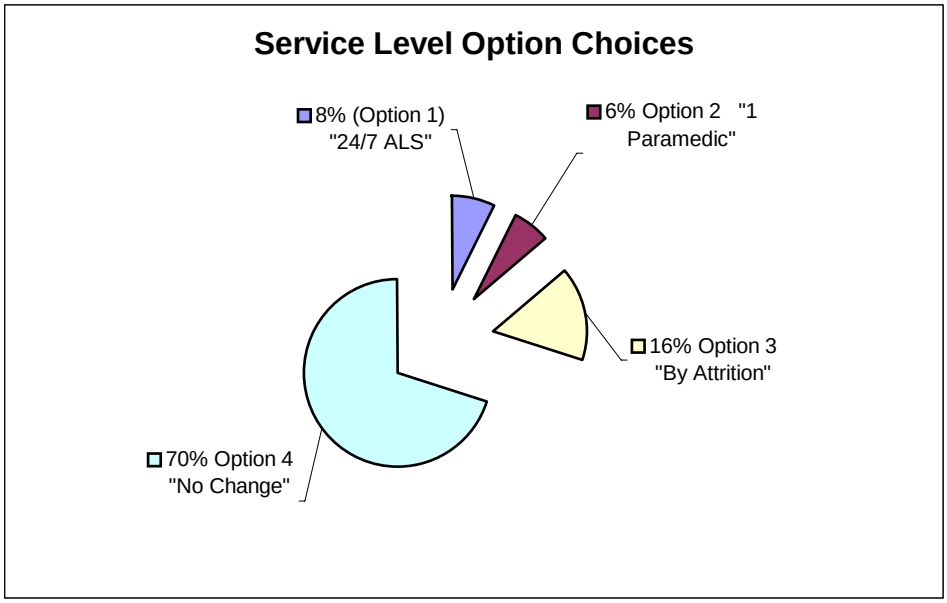


Figure 7

It was interesting to note that 67% (4 of 6) of those citizens who chose the full time ALS option on the survey listed positive comments.

Part Time ALS:

Those surveyed chose the part time ALS option about 6% of the time (See Figure 7). There were no comments generated in favor of this option. Comments not in favor

included “Satisfied with current level”, “If wanted more would move to the city”, and “When will the tax increases stop? We haven’t had a raise in over 5 years.”

ALS by Attrition:

Those surveyed chose the ALS by attrition option about 16% of the time (See Figure 7). There were no comments generated in favor of this option. Comments not in favor included “Will likely lead to more dependence on government services”, “The volunteers are already overworked”, and “It was desirable to have ALS services but the extra taxes at this time are a concern.”

One of the comments noted contained an interesting suggestion. The respondent suggested that the additional property tax ($.20/$1000 valuation) be segregated in a reserve account and allowed to accumulate until sufficient funds existed to make the program self-sustaining. This was a possibility the fire district had not considered to this point. Reserve accounts, or sinking funds as they are sometimes called, are a good way to accumulate funds. They have some drawbacks, as well. However, this suggestion was well worth exploring.

No Change in Level of Service:

The fifth option was to make no change in the EMS level of service, maintaining the current tax rate and working for improvement within its structure. This option was the clear choice of 70% of those members responding to the survey (See Figure 7). The theme repeated repeatedly was *No additional taxes!* (Appendix L).

However, making no change in the provided EMS level of service does not mean we should not identify and implement other changes that may improve our EMS delivery.

Several ideas have been identified during literature review that, if adopted, could easily result in substantial program improvement.

Findings Based on Research Question #3:

Level of Service:

Finding #5: Based on the results of the Emergency Medical Service Level Survey, the clear EMS service level choice of the community was that the level of service should remain unchanged.

Improvements to Service:

Finding #8: Based on information gathered and developed for this research paper, careful EMS data tracking and evaluation based on clear, concise program goals was critical to determining the effectiveness of each EMS program or any of its components.

Finding #9: Based on information gathered and developed for this research paper, improvements in the quality of service while maintaining the ILS level of EMS service are possible.

Finding #10: Based on information gathered and developed for this research paper, development of alternative, long term financial support was critical to growth beyond simply keeping pace with the population.

Finding #11: Based on information gathered and developed for this research paper, volunteer personnel are the backbone of the fire district's ability to carry out its mission. Therefore, training, nurturing, and recognizing the district's volunteers was the primary responsibility of staff and management.

Research Question Four:

What is the general level of satisfaction of the community with the currently available EMS?

Research question number four attempts to quantify the level of satisfaction the citizens of the fire district feel with the emergency medical service currently available in the community. Questions two, four and five in the Emergency Medical Service Level Survey deal directly with this concern.

Results of Emergency Medical Service Level Survey Question Number Two:

Question number two asks plainly whether the respondent was satisfied with the emergency medical service currently available. Of those responding, 96% answered that they were satisfied with the current level of emergency service and four percent were unsatisfied (See figure 8). Of those that answered that they were not satisfied, 75% indicated a preference for option one, 24/7 ALS (See Appendix J).

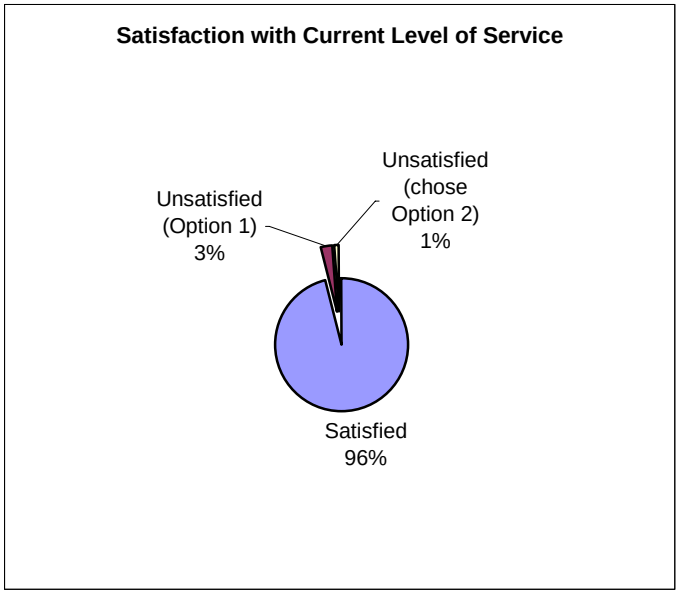


Figure 8

Question three of the survey provided a limited means of determining the community's satisfaction with the current program by offering choices of other programs in place of the current one. In this case, 70% chose to remain with the current program while 30% chose different options (see figure 7). The responses to this question are potentially colored by the additional costs of the other programs, limiting the value of the data for this question.

Results of Emergency Medical Service Level Survey Question Number Four:

Survey question four provided the means to determine whether actual experience with the current EMS program colored the responses of survey question five, in which the respondent rates the fire districts EMS program. Of the 80 citizens responding, 52% reported having used the fire district's EMS system prior to the survey (See Appendix J).

Results of Emergency Medical Service Level Survey Question Number Five:

As can be seen in Figure 9, the overall performance rating was very positive for the district. A full 60% of the responding households rated the fire district's current EMS program as *Excellent*. The survey indicated 85% of the responding households rate the district as *Excellent* or *Very Good*. The middle choice, *Good*, was meant to represent the average EMS program, and received 11% of the household votes. Four percent of those responding rated the fire district as *Fair*, and *Poor* received no votes at all. With 85% of the households rating the current EMS program as above average and only 4% rating it below average the fire district has a very solid reputation for good EMS service (See Appendix J).

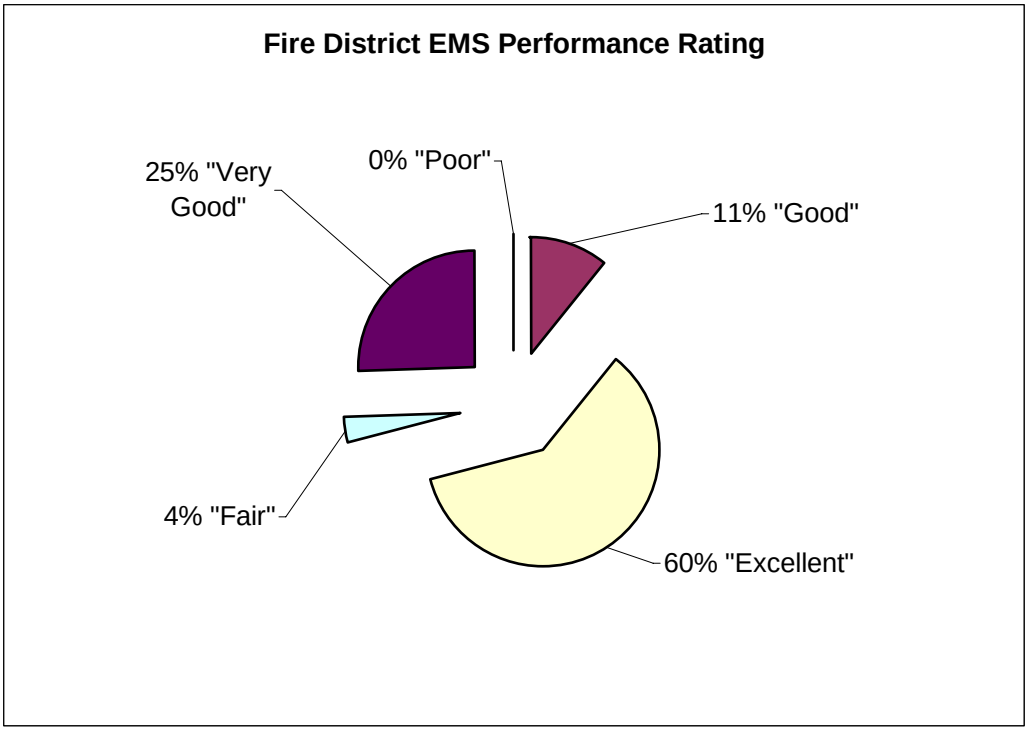


Figure 9

When the responding households are separated according to whether or not they had actually used the district's EMS program, the ratings illustrated there was a very substantial difference between the feelings of those who had experienced the service and those whose perception was based on neighbor's feelings and on actual contact with those who used the system.

Those who had not had personal experience with the system rated it substantially lower, closer to the average, than those who had used it (see figure 10). The rating of *Excellent* was given as the choice by only 41% of the respondents, with an identical percentage choosing the *Very Good* rating. *Good*, the average rating, received 11% of the votes, and *Fair* received 7%. *Poor* received no votes at all (See Appendix J).

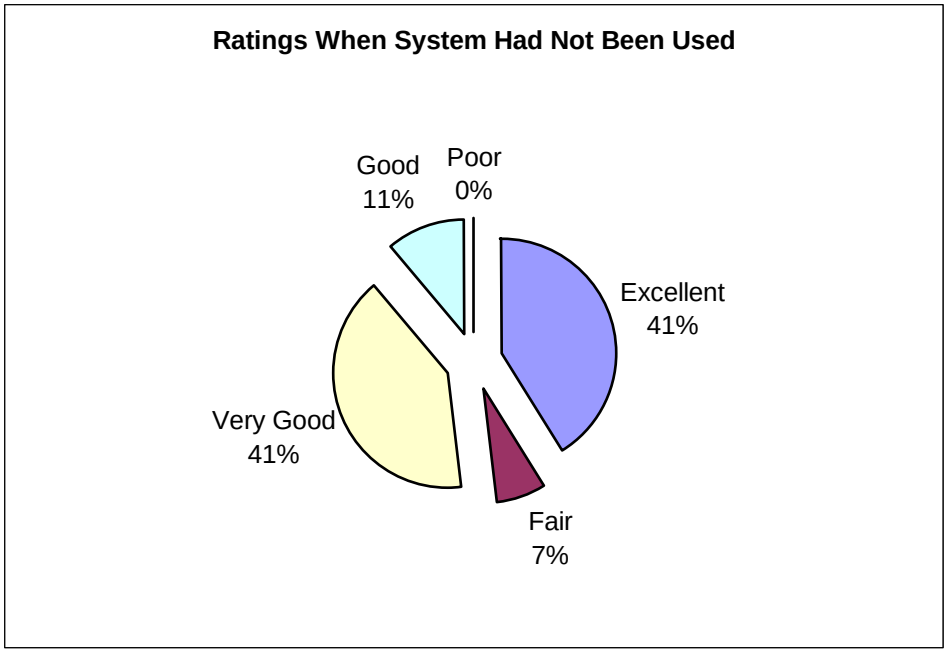


Figure 10

Figure 11 indicates the results of the ratings for those who have actually used the service. A substantial increase was apparent in the *Excellent* rating (79% compared to 41%), with the *Very Good* rating falling to 13% and the ratings of *Fair* and *Poor* receiving no votes at all (See Appendix J).

The differences in ratings between those who have used the program and those who have not indicate that actual use of the current district's EMS program significantly improves the ratings given by responding households within the fire district. Those who have used the system were more satisfied with the system than those who had not had that experience.

Comments from the Emergency Medical Service Level Survey:

The last section of the survey was reserved for comments. The section was left purposely open ended so that respondents would feel free to voice concern, comment on

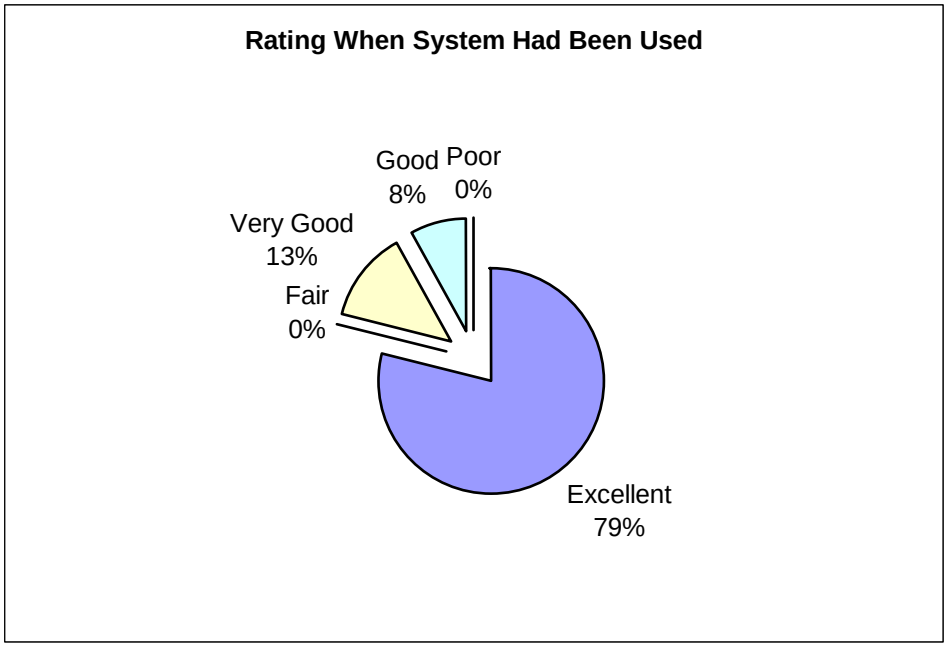


Figure 11

district operations or to make suggestions. The section was well used, with 84 comments being received. Comments ranged from "Excellent fire district!" to "The Fire Chief makes too much money." Because the comments received are general in nature rather that specific, they will be cited directly, during discussion, in the next section of the research paper as they apply (See Appendix L).

Findings Based on Research Question #4:

Finding #6: Based on the results of the Emergency Medical Service Level Survey, the community holds the fire district's current EMS program in extremely high regard.

Finding #7: Based on the results of the Emergency Medical Service Level Survey, there was a high positive correlation between use of the EMS program and regard for the EMS program.

Unexpected Findings:

Because of the nature of the surveys, there was opportunity to obtain a great deal of information not specifically required but pertinent to the problem as it presents in its environment. Several findings were extracted that bear directly on the issues at hand, as well.

How Does Mist-Birkenfeld Compare to Other Districts Surveyed?

Let's look at the data produced by the EMS Program Survey (See Appendix I), the one that went to the 25 other fire districts. Our fire district provides a maximum of ILS care. Of all those surveyed, ILS providers made up only 27% of the whole. In general, fire districts tend to move directly from BLS to ALS, bypassing ILS altogether. However, the districts that do support ILS programs share some common characteristics.

ILS districts tend to depend more heavily on volunteers than BLS or ALS districts. In fact, an average of 94% of the personnel in the responding ILS districts were volunteers. M-B RFPD's percentage of volunteer personnel to career was 96% even higher than the average. (See Figure 12)

The ILS districts in this study tended to have fewer EMTs than either ALS or BLS districts. An interesting anomaly appears here in that an average of 2.5 ALS personnel are reported present in these districts. Perhaps this is due to Paramedics working outside the district and volunteering for the fire district, or this number may also represent the presence of a private ambulance company in the district or available to the district. When compared to the average ILS district surveyed, M-B RFPD has slightly fewer EMS total personnel, a slightly larger percentage of ILS personnel, and no ALS personnel at all. (See Figure 13)

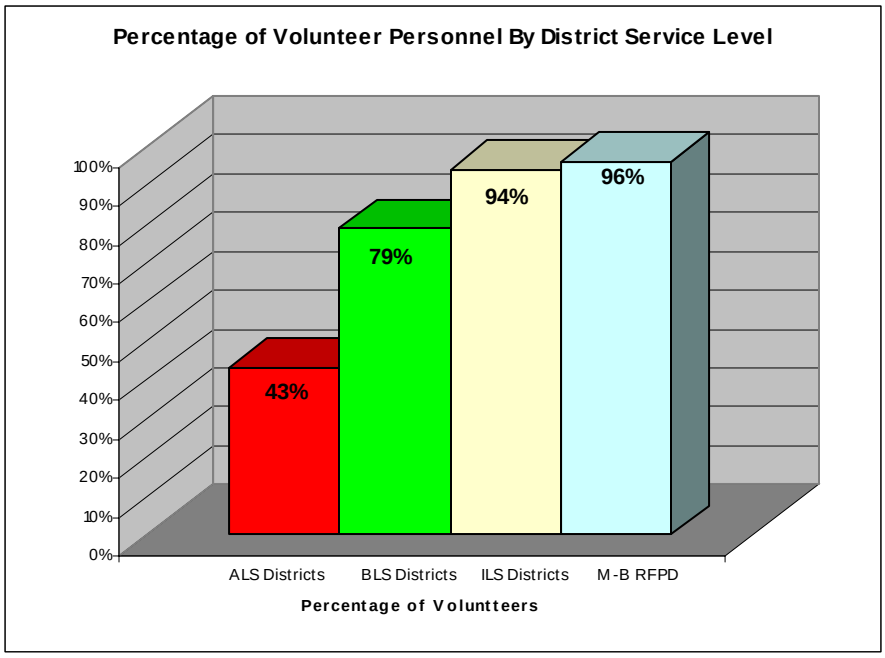


Figure 12

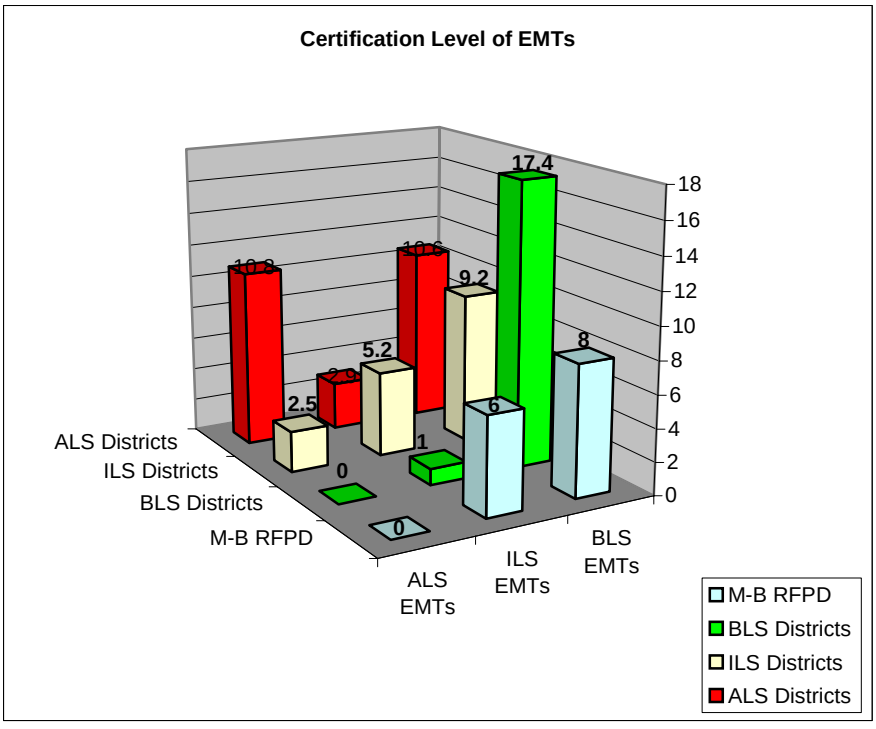


Figure 13

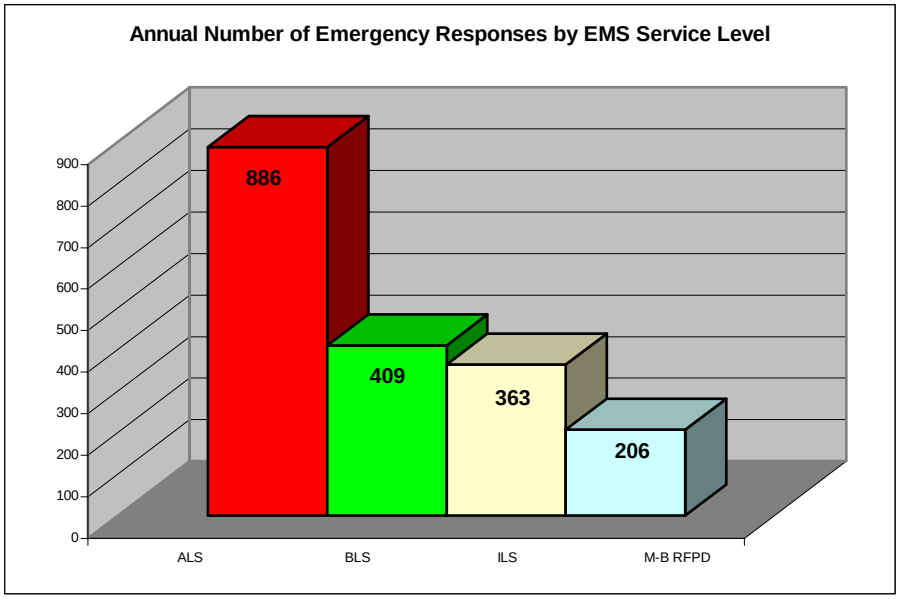


Figure 14

As you can see in Figure 14 (above), ILS Districts also average the lowest emergency response volume of the group, and M-B RFPD's average response volume was significantly below even that number. Call volume was lower because ILS districts tend to develop in sparsely populated, rural areas that generally will not support a paramedic program.

When comparing district populations and size in square miles a marked difference appears which goes a long way toward explaining the choices of the fire district's citizens. The average ILS district has a population of 5758 and an average size of 115 square miles. M-B RFPD has a population of about 1300 and an ambulance service area of 165 square miles. When the population is divided by the size of the area served, the result is called *population density*, or persons per square mile. Figure 15 (below) indicates how the population density for M-B RFPD compares to the averages for other districts.

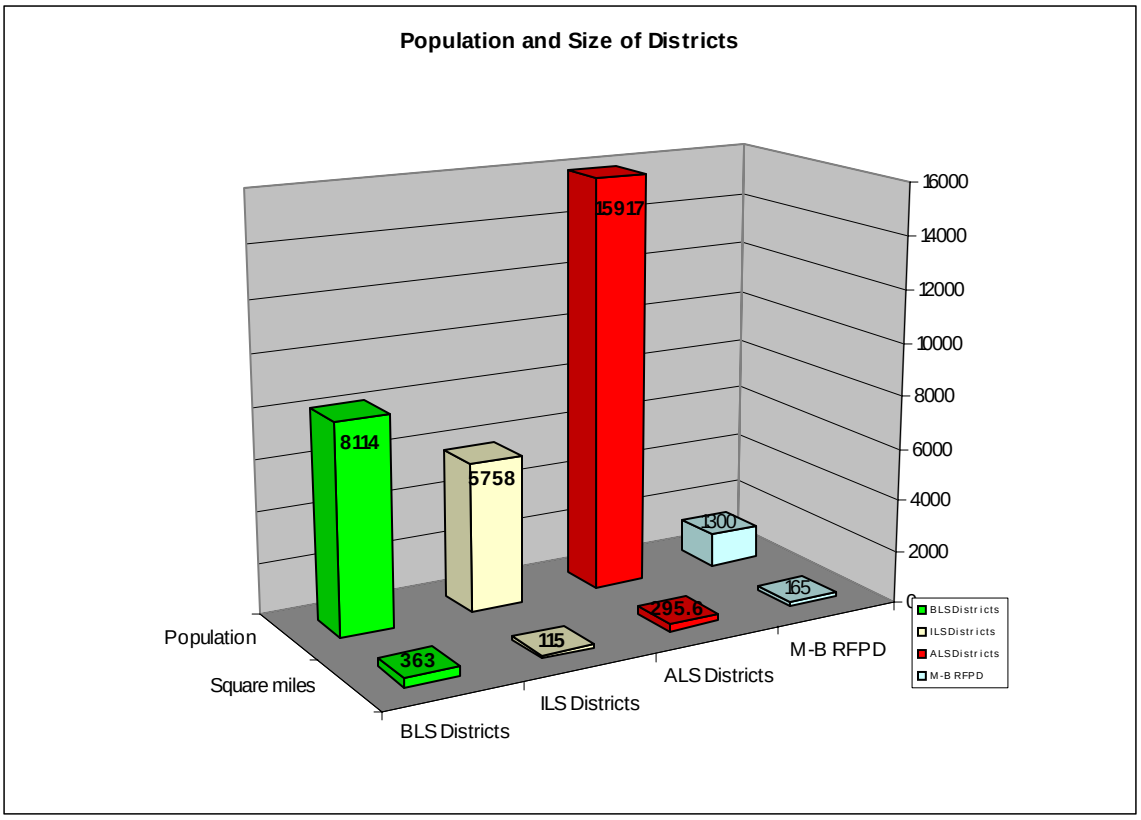


Figure 15

When figuring what the tax impact will be for each option, population density was important. The more people present in the district to share the cost of a program, the less the program will cost each individual property owner (See Figure 16). This finding indicates a particularly low population density leading to a particularly high rate of taxation for services that is potentially reflected in the community's choice not to change the service level.

Mist-Birkenfeld RFPD operates with 96% volunteer force, which was higher than the averages for any level of provider surveyed. The district operates with slightly fewer personnel than the averages of any of the surveyed provider levels, but when the local population was factored in, the results change dramatically.

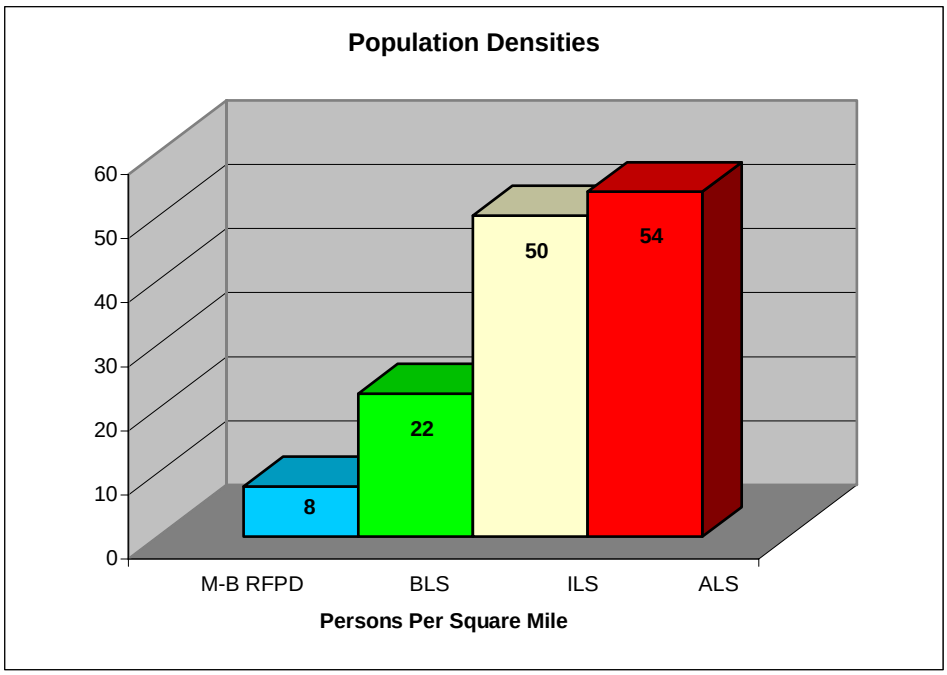


Figure 16

The last unexpected finding was the number of volunteers compared to total fire district population. By dividing the number of volunteers by the total population a percentage was produced that represents the number of people in the fire district that volunteer for every 100 people who live in the district (See Appendix I). As expected, ALS districts, having the highest number of paid personnel, show only .07 volunteers per 100 citizens. BLS districts fare better with .18 volunteers per 100 citizens. ILS, as expected, shows the largest average number, with 2.8 volunteers per 100 citizens. As can be clearly seen in Figure 17, Mist-Birkenfeld RFPD was receiving 1.08 volunteers per 100 citizens, which translates to 386% the rate of the average ILS fire district surveyed. With a rate of volunteerism of nearly four in every one hundred citizens, it was clear the community of Mist-Birkenfeld is very willing to participate in providing emergency service.

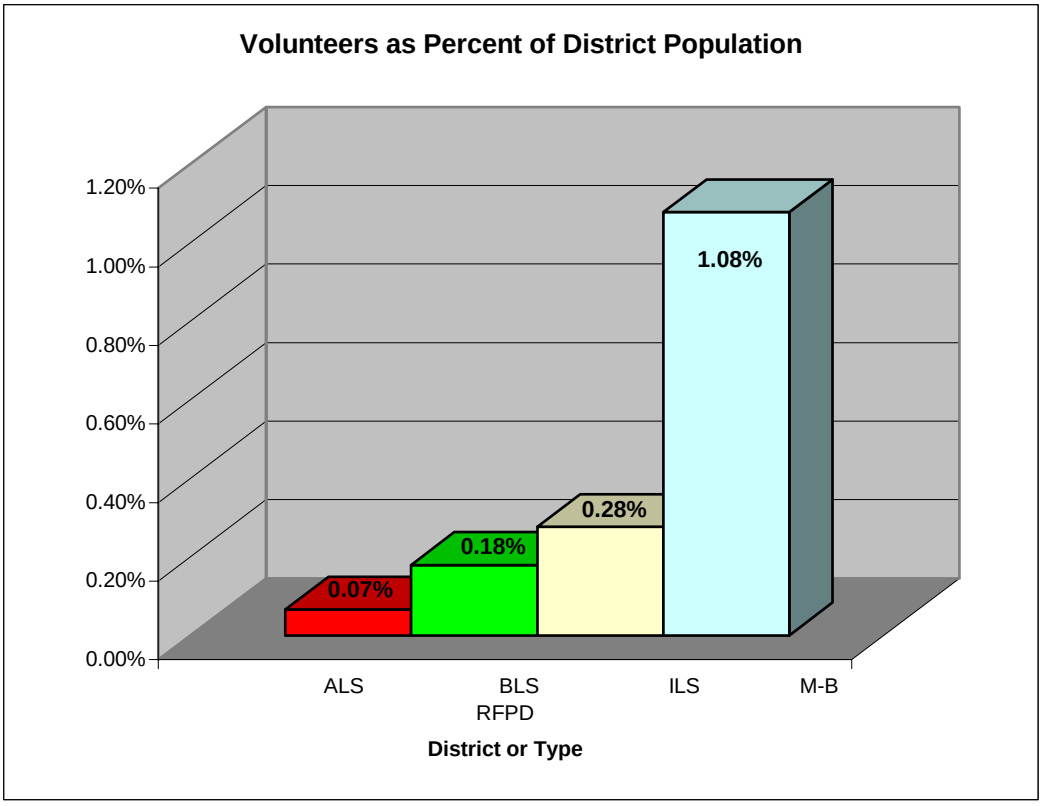


Figure 17

Unexpected Findings:

Finding #12: Based on the comparative information presented above, Mist-Birkenfeld fits most closely within the characteristics of an ILS fire district.

Finding #13: Based on the comparative information presented above, Mist-Birkenfeld RFPD has a population density far below the average of any of the surveyed fire districts.

Finding #14: Based on the results of the EMS Program Survey when compared to Mist-Birkenfeld RFPD statistics, Mist-Birkenfeld RFPD is experiencing a very strong rate of volunteerism when compared to like districts.

DISCUSSION:

Introduction

This research paper deals directly with the question of what the appropriate level of EMS service is in a frontier/rural Oregon fire district. Rural fire districts across the nation struggle daily with the question "What level of service is right for my community?" (Rodenberg, 2002a, 2002b, 2002c; Waite, 1996,) Certainly, the public we serve deserves the best possible care we can provide, given that resources are available to provide the best possible care (UP-EMS, 2000). Advanced Life Support Emergency Medical Service is generally considered to be the standard level of prehospital emergency medical care by which all others are measured and, when sufficient resources are available to support ALS, it is certainly prudent to consider moving toward that standard, from BLS or ILS programs to ALS (NCSL, 2000;Rodenberg, 2002a, 2002b, 2002c; Waite, 1996). However, what happens when the resources, otherwise known as funds, are not available to move to ALS?

When resources are limited, the community served must make an informed choice as to how best to spend the resources they have and then act by supporting their choice with the additional resources needed. What happens when the community decides, perhaps out of necessity, that *the best* is more than they can afford? When voters choose not to support the best possible level of service, the most important question becomes, "How can the fire district use the existing resources, entrusted by the voters, differently to improve the quality of the service that currently exists?" There is no mandate that proclaims that a community must provide prehospital emergency medical services. Local EMS is a function of the community whose scope and cost are deliberated and sanctioned

by the voters of the district. The community's responsibility to choose, collectively, and their willingness to support their choice once it is made, is central to the conclusions of this research.

From fire suppression programs to search and rescue programs to emergency medical programs, emergency service providers constantly seek opportunities to improve, to do the job faster, better, less expensively (CEMS, 1999; Irwin, 2001; McDowell, 2001; Rodenberg, 2002a, 2002b; UND, 2000b). Perhaps we can learn do some things differently and, perhaps, in pursuit of performance improvements, we can learn to do some different things (NCSL, 2000; Rodenberg, 2002a, 2002c).

The Scope of the Problem

Rural EMS in general faces significantly greater challenges than their urban brothers and sisters. According to the National Rural Health Association (2002), rural populations contain 17% more persons over 65 years of age with access to about half the doctors. Rural populations tend to be poorer (27% less income per capita), with 14% living below the poverty level. Chronic illnesses are more prevalent in rural areas and transportation to obtain health services is more difficult to obtain. In addition, alcohol abuse is widespread among rural young people (See Appendix P). All of these concerns tend to produce more need for emergency medical services, while at the same time inducing practical limits upon them. In fact, according to the National Conference of State Legislatures (2002), "In rural areas, most needy of EMS, career personnel are in severe shortage because of the high volume of work and the scarcity of resources."

What was the impact of the lack of ALS in the Mist-Birkenfeld RFPD? How many EMS responses required ALS techniques to save a life? Surprisingly, the answer

was none. There were no instances identified during the period of the study. D.C. Berg was asked to search the records of 1996 and of 2002 (See Appendix E), which again yielded no patients who could have been saved through application of ALS.

From the perspective of a Fire Chief, the fact that there were no patients lost who could have been saved had a functioning full time ALS program been in place was bothersome. It seemed logical that ALS was the best level of EMS and therefore a move to ALS would save lives, as is commonly accepted (Rodenberg, 2002a). Therefore, some of the lives lost during the study period should have been savable by applying ALS skills and protocols. After consulting with D.C. Berg and reviewing each case where there was a fatality as an outcome, the reasons for this statistic emerged. The major reason was that the district is very large (165 square miles of Ambulance Service Area) and characterized by large areas of frontier (accessible only by unimproved logging roads), interspersed by smaller rural areas surrounding state and county roads. Emergency response to the incident scene in these areas can be delayed by as much as 60 minutes, depending on location. That is a significant amount of time in terms of emergency medical service.

The second reason for the statistic was location of the fire district in relation to emergency medical treatment facilities. The district is located a minimum of 30 miles (45 minutes with emergency lights flashing and the siren operating) from the nearest hospital. The district is large and in some places accessible only by dirt or gravel logging roads. Transport from these locations (with the patient feeling every bounce) to the nearest hospital may take as long as 150 minutes (Average transport time is 75 minutes). That is why Life Flight is used so often in this region.

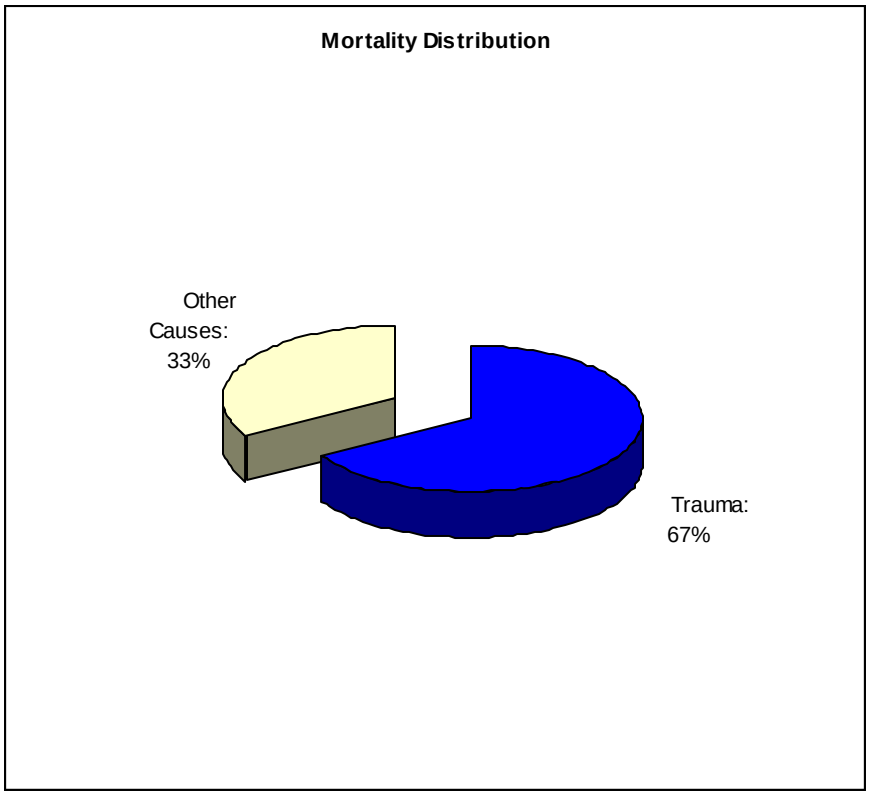


Figure 18

Additionally, six of the nine fatalities (67%) experienced in the Mist-Birkenfeld RFPD during the five years studied were victims of massive trauma secondary to high-speed motor vehicle crashes or to logging accidents (See Figure 18). Interestingly, one of the findings listed in *What's Different About Rural Health Care?* (NRHA, 2002) was that rural residents are twice as likely to die in a motor-vehicle accident as urban residents are. After considering the above, the statistics for the number of lives that may have been saved had ALS been present in the community made perfect sense (See Appendix E). Therefore, if we choose to define the impact of ALS solely in terms of lives saved (Rodenberg, 2002a), there was no impact in the fire district during the period studied.

However, if we choose to define the impact of ALS in terms of emergency responses where ALS was required (or at least sought) and where Life Flight (local air ambulance) was called to transport, an average of 3.8 patients per year are identified (See Appendix E). (Inverting the statistic indicates that more than 97% of the time BLS or ILS skills were the maximum level of service required to mitigate the emergency.)

Additionally, there are times when patient stabilization or patient comfort during a long, transport over rough, unimproved roads would make ALS medications and treatments desirable if not essential. These type of responses account for an average of an additional four patients per year, for a total of 7.8 patients (average) per year who may benefit from an ALS level of care (See Appendix E). This accounts for an average of a little over 5% of the total EMS calls experienced in the fire district per year.

Obviously, the definition for the impact of ALS was subjective, with those who believe that ALS should be the standard for every EMS response, and those who say that because there have been no deaths attributable to lack of ALS in the district there was no impact at all (See Comments, Appendix L). Because we live in a democratic society and because we have the freedom to choose, it is right, fair and prudent to allow and informed citizenry choose the path that the wish their fire district to follow. A survey was produced to allow each household to make that choice and to tell the fire district about that choice (See Appendix J). Once the collective voice of the community was heard, the fire district could plan and implement the program chosen.

The findings discussed in this section indicate that while rural areas do tend to have greater health problems than urban areas (NRHA, 2002; NCSL, 2002) the scope of the problem as experienced in the Mist-Birkenfeld RFPD was that ALS techniques or

medications (OARs, 2002; Appendix C) would have saved no lives during the period studied, were required to properly care for patients 2.5% of the time (See Appendix F) during the period studied, and may have benefited a maximum total of 5% of those patients seen in response to an EMS call (See Appendix F). That translates into an average range of four patients per year who require ALS to eight patients per year who require ALS and/or would be more comfortable as a benefit of ALS availability (in whole numbers).

Options Developed

When *options* are presented, there is the implication that a choice will be required. In this case, a collective choice was required of the citizens living within the fire district. The district decided to use a survey to determine what level of service the community would choose.

The choices presented to the citizens of the district were realistic in scope, representative of current local and regional EMS programs, represented fairly, and were accurate as to cost (See Appendix B, J). Every effort was made to be sure that the respondent fully understood the issues and could then make an informed choice. The options presented were *Full time ALS, Part time ALS, ALS through Attrition,* and *No Change in Level of Service* (See Results section and Appendix I for details on development of options).

Community Reaction

The least favored option of the four that were offered was option 2, Part Time ALS, which scored only 6% of the responder's votes. Of all the options offered, option two was the most difficult to clearly explain. Many of the costs could vary widely,

producing an unstable and difficult to manage program. When the results of a choice are unclear, especially involving taxes, taxpayers may understandably shy away (See Appendix K).

Running a distant third was option 1, Full Time ALS, gathering 8% of the responders. While it was clear that the people of the district value ALS availability, it was also clear that they feel the pinch of property taxes and poor economic conditions (See comments, Appendix L). Additional taxes are not a popular choice these days among voters, even for ALS service. Oregon has had three instances of property tax revolt in recent years, resulting in tax limitation measures 5, 47 and 50. Interestingly, these measures subverted the democratic notion of *majority rule* in that they added constitutional requirements for larger percentages of voters required to approve a tax measure and double majorities (50%+ of registered voters must vote 50%+) during elections where only state and local issues were considered (DOR, 2002). This is, in effect, an effort to counter the strength of local issue supporters and voter apathy (See Appendix K).

The second most popular choice was option 3, ALS through attrition, with 16% of responders choosing this option (See Appendix K). This choice was added as a common sense approach, limiting additional resources needed, extending the time for implementing an ALS program seven to ten years, and allowing the fire district to include the process in long term planning. The issue of the necessity of raising taxes and the fact that the program could be ten years away weighed against this option. The option got people thinking, though, as evidenced by a comment from a responder, who said “Create an account using these taxes. Hire after the account is self-sustaining.” “ALS would only

work if you could reduce response time. Area you cover too large“, was another comment from this group that indicated a lot of thought went into the responses. (See comments, Appendix L)

The community's favored choice for survey question three was overwhelmingly clear and completely unambiguous. Fully 70% of those who responded to the Emergency Medical Service Level Survey chose option 4, requesting no change in the level of EMS service in the district (See Appendix K). Reasons for the response varied, but there was a common theme. *If it will cost us more, don't do it.* This group was well informed and had obviously thought the problem through, as evidenced by their comments. One comment received stated, "People are struggling now, but the need was real." Another said, "It is desirable to have advanced life support but the extra taxes at this time is a concern." Another comment zeroed in on the primary issue when they wrote, "When will tax increases stop? We have not had a wage increase in 5 years+." (See Comments, Appendix L)

Another reason for the remarkable support of the *No Change* choice was the level of community satisfaction with the current EMS program. Community satisfaction was very high, with 96% indicating they are satisfied with the current level of service. The program received an Excellent rating from 60% of the responding households (See Appendix K). Further, the top three categories (*Good*, *Very Good* and *Excellen*t) received 96% of the votes for this question (See Figure 9, page 75). A comment from survey number eight seems to say it pretty clearly, "Excellent department!" (See Comments, Appendix L)

Sometimes ratings are influenced by perception rather than actual experience. The district decided to test whether the EMS program ratings were different between those who had actually used the system and those who had not. Indeed, there was a marked shift in the ratings. Among those responding who had not used the system there was a rating of 41% *Excellent*. Among those who had used the system the rating went up to 79% *Excellent*. Contact with the EMS program has a very decided effect on the program rating. Those who have had personal contact with it tend to rate the program much, much higher. (See Figures 10, and 11; Appendix K)

Improving Service Using Current Resources

Patient Care

Let's go back to the question posed earlier, "How can M-B RFPD use the resources we have differently in order to improve the quality of the service that currently exists?" The place to begin is our EMS operational philosophy. For years, we, as emergency responders, have assumed that the pinnacle of EMS service in our communities was an ALS program using well-trained and experienced Paramedics (Rodenberg, 2002a). That assumption implies that anything less is just not good enough. If we, as did Dr Rodenberg (2002a), clearly define our primary goal as patient lives saved, or as decreased morbidity (the severity of illness or injury) then there is an objective measure for evaluating our EMS program. That is true whether the district is an ALS provider, a BLS provider or an ILS provider.

Dr. Rodenberg (2002a) contends that insufficient data are available to determine whether ALS truly saves lives, and that the data that are available actually indicate only two situations where lives are saved in the prehospital setting. The first is in the case of

early defibrillation of pulseless cardiac arrhythmias. The second is in providing aggressive airway management when oxygenation is compromised. Dr. Rodenberg discounts *trauma* lives saved because they are saved by a team of professionals far larger than the prehospital treatment crew is by itself (EMTs). Further, Dr. Rodenberg notes that neither of the proven life saving treatments are solely the province of the Paramedic. BLS providers are now fully certified to provide cardiac defibrillation (OARs, 2002). Additionally, airway management device advances in recent years challenge endotracheal intubation as the industry standard, and may actual be safer for the patient (Rodenberg, 2002a). It is entirely possible that, with careful planning, certification, and training BLS and ILS programs will be able to address of the medical problems that currently require ALS certification.

Oregon is one of the states considering broadening the scope of practice for the EMT-Intermediate. Morphine (pain management), Endtital CO2 Capnometry and Pulsoximetry, Ipratropium for bronchospasm, and Benxodiazepine for status seizures and as an anticonvulsant are all being considered for addition to the EMT-I scope of practice (See Appendix O). If that is adopted into practice an intermediate life support provider will have many options to improve EMS service that were previously unavailable. (See Appendix O).

Dr. Rodenberg (2002c) comments, “if advanced BLS measures turn out, after study, to be as effective as traditional ALS measures with less risk or invasiveness, logic would dictate that we adopt them.” EMS is changing, growing, maturing, as a profession. We all, as emergency service providers, need to grow as a part of it.

Embracing Change

Perhaps the toughest thing for an EMT to do is to embrace new ways of tackling old problems and new ways of thinking about what our roles are supposed to be in our communities. There is a saying that goes, "95% of what you do in the field is covered by basic life support protocols. Only 5% of your time is spent working as a Paramedic." That observation applies to EMT-Intermediates, as well. If the EMT does a good job applying their *basic* skills, the patient will usually do well. Rodenberg (2002) believes that the clear division between BLS and ALS is increasingly "blurred" and that the differences between the two are increasingly academic. The rapid evolution of the EMT-Intermediate scope of practice (See Appendix C; OARs, 2002), the EMT-Specialist (UP-EMS, 2002), and the recognition that BLS may well be able to practice limited forms of what was once considered to be strictly ALS protocols. In their turn, ALS protocols are expanding yearly to include administration of thrombolytics in the field, 12 lead EKG's, and radio based telemetry of patient data. We can harness change, make it work for us, and in doing so improve the quality of the service we provide our customers (patients). (NCSL, 2000)

Resource Development

Program improvement is possible through developing additional financial resources. Financial pressure is one of the major problems facing rural EMS in the studies researched (CEMS, 1999; NASEMSD, 2000; NCSL, 2000; UP-EMS, 2002). Local funding of rural EMS is difficult to obtain, at best. Identified options for alternative funding include partnering with private companies, developing fee structure for EMS service, aggressively seeking grants, and becoming active in state and local

political groups to get your message heard. However, NASEMSD (2000) warned, simply finding the funds to purchase apparatus and equipment will not provide a long-term financial solution unless operating funds are in place. A new service compensation model was one suggestion to secure operating funds (NCSL, 2000). Finances would be based on preparedness rather than responses, rewarding readiness and foresight.

Personnel Development

Another way to improve the quality of our emergency medical service is to improve the quality of our volunteers. We can do this by recruiting quality people, by challenging and developing those recruited, and by retaining those trained and prepared for duty (NCSL, 2000). According to the UND Center for Rural Health (2002), *Volunteer personnel donate their personal time to provide prehospital care and are usually expected to be available 24 hours a day, and on weekends and holidays.* Moreover, they do so without expectation of reward. One of the ways such people receive satisfaction is through recognition. Although recognition in public is often appropriate, it was recognition among their peers that was most important to most volunteers (Irwin 2001;McDowell, 2001; UND,2000).

Providing challenging, cutting-edge training has been shown to be a means of motivating and keeping volunteers. In Michigan, it was not the time required for training that was the major problem. It was not the scheduling or the quality of the instructor. It was the availability of training that was the major training issue (UP-EMS, 2002). Cost to the volunteer was the second most noted training concern, followed by distance to training. These trends noticed in Michigan are clearly concerns at Mist-Birkenfeld RFPD. We can answer these concerns in at least three ways. The first suggestion is to

maintain close association with local emergency services training organizations. If one does not exist, organize one in cooperation with other service agencies in the area. This answers both cost and availability concerns. The next suggestion is to develop qualified and enthusiastic instructors. The third idea is to bring in noted instructors from outside to carry out specialized class. Well-trained volunteers are happier, well motivated and proud to be a part of the organization.

Finally, incentive programs, used most by ILS providers, provide a means of reimbursing volunteers for their out of pocket costs. They also deliver a message of recognition and appreciation from the Board of Directors.

Conclusion

Rural EMS has not been able to match the organization or the level of service that is attainable in most urban areas (UND, 2002). The reasons are fairly well defined and are detailed by the UND Emergency Medical Services program. The reasons include sparse populations covering large land areas, rural state and local governments have fewer funding options, failing rural economies, profit potential is not present for rural EMS, and demand for service outpacing available funds (CEMS, 1999; NASEMSD, 2000; NRHA, 2002; UND, 2000a). Each of these problems is present in the communities that support Mist-Birkenfeld RFPD. Each of them played a role in the community's decision to maintain services, and costs, as they currently are.

As an agency providing public service, Mist-Birkenfeld RFPD takes its marching orders from those that pay the bills…the citizens of the fire district (ORS, 2001). In the final analysis, if public service agencies expect to enjoy the financial support and personal trust of the public they serve, they must learn to listen when their bosses speak.

In the case of determining the appropriate level of emergency medical service for this fire district, the message delivered was clear and unequivocal. For various reasons, not the least of which was the constant upward pressure of property taxes, those responding to the Emergency Medical Service Level Survey chose to make no changes in the service level and to make no changes in the tax rate (See Appendix K).

What are the citizens really saying to the fire district about the Current EMS program? It is true that 70% said they wanted no change. However, thirty percent indicated they did want improvement. Eighty-five percent of the same people also said that the EMS service is *Very Good* or *Excellent.* In addition, those that have used the service rate it even higher. The level of satisfaction with the current EMS program was 96%.

This researcher believes that the district's patrons have simply said they cannot afford to upgrade to ALS at this time, as desirable as the change might be. They are saying that feeding, clothing and educating their families was a higher priority than implementing an ALS program in the district. One survey responder commented," How many patients lost from lack of ALS? I checked the records. None" (See Appendix L). The perception of some, perhaps many, is that there is simply no impact evidenced in the record of an overriding need for an ALS program in the fire district.

RECOMMENDATIONS

The research indicates that the recommendations for action that follow, based on specific findings, will appropriately and materially address the stated problem and the identified issues that surround it.

Recommendation #1: Based upon research Findings #1 through #5, no change in level of service should be planned unless such plan can include the cost of development of the program and of its operation in the budget produced by the current tax rate. Special attention should be given to the possibility of attaining the ALS service level without additional funding. This may be done by requiring any new employees for currently supported positions to be certified as paramedics.

Recommendation #2: Based on Finding #9, improvements in the quality of EMS service available in Mist-Birkenfeld RFPD should be sought. At a minimum the vehicles for program improvement should include enhancements to the EMS training program to gain the cutting edge, creation or enhancement of a regional EMS training association, development of volunteer personnel in terms of leadership, development of volunteer staff in terms of training and instructional skills, and development of volunteer staff in terms of expanding both personal and professional skills. Additionally, expansion of the ILS scope of practice should be encouraged and supported, locally, on a state level, and nationally.

Recommendation #3: Based upon Finding #9, it is recommended that the fire district plans recognize and embrace change, understanding that change is the natural order of social organization.

Recommendation #4: Based on Finding #8, regular EMS data tracking should be implemented, and that the data produced should illuminate specific, concise, clearly identified operational goals, objectives and including definitions of terms and concepts critical to such data.

Recommendation #5: Based on Finding # 10, identify and develop alternative financing to implement the adopted Mission of the fire district and to further each of the goals of its strategic plan.

Recommendation #6: Based on Findings #12 and #13, formally recognize and include in planning efforts the size and character of the fire district's operating environment, understanding the limitations linked with that size and character as well as the strengths inherent with that make up. A low population density imposes a correspondingly high cost on the citizens for universal public services. However, having limited emergency medical services is a trade-off many residents are willing to make for the peace and solitude of a rural or frontier environment.

Recommendation #7: Based on Findings #6, #7, and #14, planning efforts should take into consideration the value of the relationship the fire district has with the community, as evidenced by the high regard the community holds for the fire district's EMS program and by the phenomenally high percentage of community citizens who volunteer for the fire district.

Recommendation #8: Based on Finding # 11, seek ways to recognize the efforts of the volunteers of the district who make up 96% of its personnel who make carrying out the mission of the fire district possible. The district should assist them to develop personally and professionally, recognizing that the primary job of fire district staff is to develop and nurture the volunteers.

Presentation

The recommendations set down in this section were presented to the Board of Directors of Mist-Birkenfeld RFPD at the regular business meeting held January 14, 2003. A copy

of the research findings was appended. A formal presentation of the study will occur on February 25, 2003. The Fire Chief will seek adoption of the recommendations at the next regularly scheduled business meeting, on March 11, 2003. Plans for implementation of the recommendations will follow as soon as they are adopted. (See Appendix S)

REFERENCES

Commission on Emergency Medical Services {CEMS} (1999). *Shaping the Future of EMS in California*. Retrieved September 8, 2002 from www.emsa.cahwnet.gov/Vision/vision_process.pdf.

National Association of State EMS Directors {NASEMSD} (2000, June). *Challenges of Rural Emergency Medical Services: Opinion Survey of State EMS Directors*. Retrieved December 6, 2002, from www.nasemsd.org/rural_emergency_medical_servic.html.

Irwin (2001, December*).Volunteerism: A Family Affair*. Rural EMS Initiative, number 9. Retrieved November 3, 2002, from www.med.und.nodak.edu/depts/pdf/remsifs9.pdf.

McDowell (2001, December). *Love 'Em or They'll Leave*. Rural EMS Initiative, number 10. Retrieved November 3, 2002, from www.med.und.nodak.edu/depts/pdf/remsifs10.pdf.

Office of Economic Analysis (OEA) {December 2002). Oregon Economic and Revenue Forecast. Retrieved January 20, 2003, from www.oea.das.state.or.us/economic/forcast1202.pdf

Oregon Administrative Rules {OARs{ (2002, August). *Division 35: Emergency Medical Technicians, first Responders, and Supervision Physicians*. Retrieved September 8, 2002 from archweb.sos.state.or.us/rules/OARS_800/OAR_847/847_035.html.

Oregon Department of Revenue (DOR) {September 2002). Proerty Taxes in Oregon. Retrieved November 10, 2002, from www.dor.state.or.us/property.html

Oregon Revised Statutes (ORSs) {2001). Chapter 294: County and Municipal Financial Administration. Retrieved November 10, 2002, from www.leg.state.or.us/ors/294,html

National Conference of State Legislators {NCSL} (2000, August). *Emergency Medical Services In Rural Areas: How Can States Ensure Their Effectiveness?* Rural Health Brief, August 2000 issue, from www.ncsl.org/programs/health/Forum/ruralems.htm.

National Rural Health Association {NRHA} (2002, January). What's different about Rural Health Care? Staff Directory, home page. Retrieved December 13, 2002, from nrharural.org/pagefile/different.html.

Rodenberg (2002a). *In a Perfect World, Is All EMS ALS?* JEMs Magazine, online content, e209d. Retrieved September 26, 2002, from www.jems.com/jems/e209d.html.

Rodenberg (2002b). *Readers Respond*. JEMs Magazine, online content, e209h. Retrieved September 26, 2002, from www.jems.com/jems/e209h.html.

Rodenberg (2002c). *In a Perfect World…We Debate EMS Philosophy*. JEMs Magazine, online content, e210b. Retrieved September 26, 2002, from www.jems.com/jems/e210b.html.

University of North Dakota (UND), Center for Rural Health (2000a, February).*North Dakota EMS Providers' Demographic and Work Characteristics.* Rural EMS Initiative, number 2. Retrieved November 3, 2002, from www.med.und.nodak.edu/depts/pdf/remsifs2.pdf.

University of North Dakota (UND), Center for Rural Health (2000b, June). *Personnel and Care Provision needs Among Rural North Dakota EMS Squad Leaders.* Rural EMS Initiative, number 4. Retrieved November 3, 2002, from www.med.und.nodak.edu/depts/pdf/remsifs4.pdf

University of North Dakota (UND), Center for Rural Health (2002, August*). Emergency Medical Services: Overview*. Retrieved November 1, 2002, from www.med.und.nodak.edu/depts/rural.ems.overview.html.

Upper Peninsula Emergency Service Corporation {UP-EMS} (2002, January). *Michigan's Rural EMS Report 2000*. Retrieved September 22, 2002, from www.com.msu.edu/micrh/EMS/2000EMSSurvey.pdf

Waite (1996). An Elusive Formula: *How to Bring a Paramedic Program to a Small Fire Department*. Executive Fire Officer Program Research Paper, located in the National Fire Academy Learning Center, Emmittsburg, MD.

APPENDIX A:

Etta Epling
68445 Nehalem Highway North
Vernonia, Oregon

March 16, 2000

Chief Dave Crawford
Mist-Birkenfeld RFPD
12525 Highway 202
Mist, Oregon 97016

Dear Chief Crawford,

As you know, I am a volunteer firefighter and I also am certified to drive the ambulance. It has come to my attention that the fire department's call volume is now about 75% EMS calls. I am concerned because living where we do, way out away from town, it takes a long time to get to a hospital. We have a great crew and a great ambulance but I think we need paramedics to give us the best possible care for the patients while they are enroute.

Right now we are depending on Clatskanie Fire and Metro West Ambulance to provide assistance through mutual aid. They have done very well by us , but they are also 30 minutes away. We need ALS here, in the district.

We have talked about this before and I know that you have tried to find the money to do this, but maybe it is time we put it to a vote. I would not mind paying a little more for paramedics to be here in the fire district. And there are quite a few of us that feel this way. The only thing we don't know is how much it would cost to get full time ALS in the fire district.

Please look into it again. Maybe the board would be willing to put it on a ballot.

Thanks for listening, Dave.

Sincerely,

Etta Epling

Etta Epling

APPENDIX B: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT

12525 Hwy. 202, Mist, OR 97016
(503)755-2710 or (503)755-0510
Fax (503)755-2556

November 3, 2002

To: The Patrons of Mist-Birkenfeld Rural Fire Protection District

From: Chief Dave Crawford

During the past 18 months I have been asked several times what it would take to bring advanced life support (ALS) service to the fire district. During that time I have researched the question thoroughly. It is time now to place the information in your hands and ask you, our patrons, for guidance.

There are currently four levels of emergency medical technicians supported in this state. They include:

a. First Responder – the first responder is certified to perform limited basic life support emergency medical care.

b. EMT Basic – the EMT Basic is certified to perform all basic life support procedures.

c. EMT Intermediate – the EMT Intermediate is certified to perform all intermediate life support (ILS) procedures. The Intermediate EMT scope of practice is designed specifically for rural areas.

d. EMT Paramedic - the EMT Paramedic is certified to perform all advanced life support procedures. The EMT Paramedic scope of practice includes 4 specific procedures not allowed the EMT Intermediate.

We have elected to train all of our EMS personnel to the EMT Basic level as a minimum. We also have four EMTs trained to the EMT Intermediate level, with two registered nurses also operating at that level. We currently have no EMT paramedics as members of the fire department.

APPENDIX B: **Page 2**

Advanced life support is the highest level of pre-hospital emergency medical care available in the State of Oregon. It requires a two-year college degree, after which the candidate must pass an intensive written test prepared by the Oregon Health Division followed by a practical application test prepared and proctored by the Oregon Health Division. It is very difficult to find a volunteer who is willing, or able, to dedicate 2 full years of their life to become a volunteer Paramedic. We have several volunteers who would qualify, and who would be very good paramedics. That is why in order for your fire department to provide ALS service (Paramedics) we would need to hire additional paid staff.

There are several options I researched. In order of most expensive to least expensive the options are:

To Provide 24 Hour, 7 Days Per Week ALS Service:

Twenty-four/seven coverage requires hiring three full time paramedics and one half time paramedic. In terms of cost, my research has shown that an entry level (little or no experience) Paramedic costs about $60,000 per year with insurance and benefits. That means this option would cost a minimum of $210,000 per year to implement.

In terms of additional property taxes, this option would cost each property owner about $1.63 per $1000 of assessed valuation.

To Provide a Single Paramedic, Scheduled for Night Duty:

A single Paramedic would cost about $60,000 per year with insurance and benefits. That would provide ALS coverage for about 28.6% of the time. The reality is that we would be calling the Paramedic back on overtime to assist us when needed. The cost goes up dramatically when overtime is factored in. This option would cost about $90,000 to implement.

In terms of additional property taxes, this option would cost each property owner about $.70 per $1000 of assessed valuation.

APPENDIX B: **Page 3**

To Provide Paramedics Through Attrition:

This means hiring Paramedics as replacement personnel as current hired personnel retire or leave the district. The added pay for Paramedic certification would amount to an increase of about $30,000 per year for a Fire Chief and an Assistant Chief, both with Paramedic certification.
In terms of additional property taxes, this option would cost each property owner about $.25 per $1000 of assessed valuation. However, this is a long-term solution, 7 to 10 years away.

To Continue to Provide Intermediate Life Support Service:

Making no change is also an option.
Current Emergency Medical Service (EMS) Status:
The fire district responds to about 211 emergency calls per year, 70% of which are EMS. We currently provide an Intermediate Life Support response more than 90% of the time using six EMT Intermediates as lead personnel with a response time of 8 to 10 minutes. The fire district maintains mutual aid agreements that make Paramedics available from both Vernonia and Clatskanie (about 25 minutes away) and they can meet us while enroute to the hospital when necessary. Life Flight is also available when weather permits.
Statistically, in Mist-Birkenfeld RFPD over the past 10 years, about 2% of the 150+ EMS yearly responses truly required advanced life support techniques. Over the past three years no lives have been lost that would have been saved through the application of ALS procedures.
Enclosed you will find a survey form. Completing the form will give us guidance as to *your* wishes. Please fill out the survey and return it as soon as you can. When you are done filling out the survey just fold the paper over once so that the fire district address and stamp are showing, tape it together and mail it. That is all there is to it! We will be waiting for your reply.
Thanks for your time and consideration of this important issue.
Sincerely,

Chief Dave Crawford

APPENDIX C: Page 1

Oregon State EMS, OHS (Oregon Health Services): Scope of Practice Page 1 of 3

FR - FIRST RESPONDER
B - EMT - BASIC
I - EMT - INTERMEDIATE
P - EMT - PARAMEDIC

a =EMT Ps must send a copy of the prehospital care report form to the BME each time the procedure is performed.
b =EMT Bs must send a copy of the prehospital care report form to the BME when epinephrine is administered for anaphylaxis.
c =Requires EMT - Intermediate waiver program
d =FR may perform only when providing care as part of an agency which has a board-approved supervising physician who has issued written standing orders to that FR.
e =Only if (a) FR has completed a Health Services-approved course in AED use; and (b) complies with periodic requalification requirements.
f =Only after completing a Health Services-approved course in the administration of the medication.

Current scope of practice for emergency procedures to be performed by emergency medical technicians in Oregon that are authorized by the supervising physician.	**FR**	**B**	**I**	**P**
1. Perform primary and secondary examinations	X	X	X	X
2. Taking and recording of vital signs	X	X	X	X
3. Basic airway management, including, but not limited to:				
a. Oropharyngeal and nasopharyngeal airways	. Xd	X	X	X
b. Pharyngeal suctioning	Xd	X	X	X
4. Advanced airway management including, but not limited to,:				
a. Pharyngeal esophageal airway devices			X	X
b. Endotracheal incubation				X
c. Needle cricothyrotomy				Xa
d. Transtracheal jet insufflation				X
e. Tracheal suctioning				X
f. Orogastric tubes			X	X
g. Nasogastric tubes				X
5. Use of oxygen units with cannulas or masks	Xd	X	X	X
6. Use of bag-valve-mask ventilation devices	Xd	X	X	X
7. Obstructed airway/cardiopulmonary resuscitation-infants, children and adults	X	X	X	X
8. Managing soft tissue injuries	X	X	X	X
9. Managing Suspected Fractures	X	X	X	X

APPENDIX C: **Page 2**

Oregon State EMS, OHS (Oregon Health Services): Scope of Practice Page 2 of 3

10. Managing shock by utilization of pneumatic anti-shock garment		X	X	X
11. Managing suspected medical emergencies, including				
a. Obtaining a peripheral blood specimen for blood glucose monitoring, obtained via finger-stick, heel-stick, or earlobe-puncture		x	x	x
b. Insulin shock—administration of oral glucose	Xd	X	X	X
c. Anaphylactic shock—administration of epinephrine by subcutaneous injection		X	X	
d. Poisons—administration of syrup of ipecac/activated charcoal		X	X	
12. Emergency childbirth management		X	X	
13. Cardiac defibrillation (AED/SAD *only* for EMT-B, EMT-I requires waiver program)	Xe	X	X	
14. Emergency cardioversion				X
15. Initiate electrocardiograph monitoring and interpret presenting rhythms			Xc	X
16. Transcutaneous cardiac pacing				
17. Initiate and maintain peripheral intravenous therapy			X	X
18. Initiate heparin locks			X	
19. Initiate intraosseous infusion			X	X
20. Initiate placement of femoral intravenous line				X
21. Infuse following intravenous fluids, or combinations thereof, including				
a. Dextrose 5% water			X	X
b. Lactated Ringers			X	X
c. Normal Saline			X	X
d. Any physiologic isotonic crystalloid solution			X	X
22. Draw peripheral intravenous blood specimens			X	X
23. Initiate or adminis er the following medications				
a. Naloxone			X	X
b. Hypertonic glucose			X	X
c. Atrophine			X	X
d. Epinephrine 1:10,000			X	X
e. Lidocaine			X	X
f. Nitroglycerine			X	X
g. Aspirin		Xf	Xf	
h. Nebulized Bronchodilator			Xf	X

APPENDIX C: **Page 3**

Oregon State EMS, OHS (Oregon Health Services): Scope of Practice Page 3 of 3

24. Initiate or administer any medication or blood product				
25. Maintain intravenous medication infusions and other procedures initiated in a medical facility with appropriate written instructions from the sending facility			X	X
26. Initiate needle decompression for tension pneumothorax				X
27. Initiate placement of a urinary catheter for certain trauma patients (see OAR 847-35-3_~(cl~d))				X
28. Perform other emergency tasks by order and under the direct visual supervision of a physician		X	X	X

Oregon Revised Statute 682.245 reads in part as follows:
(1) The Board of Medical Examiners for the State of Oregon shall adopt by rule a scope of practice for emergency medical technicians B, I and P

(2) The standing orders for emergency medical technicians may not exceed the scope of practice defined by the board.

(3) No emergency medical technician shall provide patient care or treatment without written authorization and standing orders from a supervising physician who has been approved by the board, (4) The policies and procedures for applying and enforcing scope of practice may be delegated in whole or in part to the Health Services of the Department of Human Resources.

The above listed scope of practice is taken from Oregon Administrative Rule 847-35-0030, dated 4/98.

APPENDIX D: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT
Standard Operating Procedures

Meet Enroute Protocol

Purpose: This protocol is designed to set a clear procedure for alerting and obtaining ALS assistance within the fire district.

Scope: The procedure applies for all situations where a patient is judged to require advanced life support assistance.

Procedure:

In the event that the senior Mist-Birkenfeld EMT on scene believes that a patient (or patients) requires advanced life support assistance, or; In the event that an officer of the Mist-Birkenfeld RFPD believes, due to the nature of the incident, that advanced life support assistance may be required, the following procedure shall be the process for obtaining such assistance:

1. When incident is located beyond mile-post 48 on Nehalem Highway North (Highway 47), or when transporting through the city of Vernonia:
    a. Contact C-Com by radio and ask the dispatcher to alert Metro-West Ambulance (Vernonia) and request them to respond an ALS ambulance to meet the Mist-Birkenfeld Ambulance enroute. Give them a contact frequency.
    b. Organize transfer point via contact frequency and proceed to the meeting place.
    c. Transfer patient to Metro ambulance.
    d. Give Metro Paramedic the patient care form after taking one copy for records.
    e. Return to quarters and place ambulance back in service.

Meet Enroute Protocol **Page 2**

2. When incident is located anywhere else in district or when transporting to St. John's Hospital, Longview, Washington:
    a. Contact C-Com by radio and ask the dispatcher to alert Clatskanie RFPD and request them to respond a Paramedic to meet the Mist-Birkenfeld Ambulance enroute. Give them a contact frequency.
    b. Organize transfer point for Paramedic via contact frequency and proceed to the meeting place.
    c. Transfer Paramedic to Clatskanie ambulance.
    d. Proceed with code 3 patient transport.
    e. Notify Fire Chief of procedure so that conditions cost reimbursement agreement with Clatskanie Fire can be honored.

3. When severe trauma is involved, where location in the district makes ground transport too time consuming, or where location in district makes ground transport likely to worsen the condition of the patient, consider placing the Life Flight Helicopter on stand-by for immediate activation. Upon arrival, triage patient(s) and activate Life Flight helicopter if appropriate. Procedure follows:
    a. Contact C-Com by radio and ask the dispatcher to alert Life Flight and request them to respond to meet the Mist-Birkenfeld Ambulance at the scene or at a convenient location enroute. Give them a contact frequency and a GPS location for the meeting place.
    b. Organize transfer point via contact frequency and proceed to the meeting place.
    c. Set up a safe helicopter landing zone and assist the pilot with landing information.
    d. Transfer patient to Life-Flight.
    e. Give Flight Nurse the patient care form after taking one copy for records.

f. Return to quarters and place ambulance back in service.

g. Remember to retrieve any patient stabilization equipment that went with patient.

Adopted: November 15, 2002

Chief David F. Crawford

APPENDIX E: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT

12525 Hwy. 202, Mist, OR 97016 (503)755-2710
Fax (503)755-2556

MEMO

Date: November 30, 2002
From: EMS Division Chief Ann Berg
To: Chief Dave Crawford
Subject: EMS Statistics, Critical Calls

Message: Dave, the statistics you requested are included below. As you know, we define "Critical Calls" as those calls that required ALS Mutual Aid or Life-Flight. Hope this helps.

EMS Critical Responses, 1996 to present date:

YEAR:	TOTAL CALLS:	EMS CALLS:	EMS TRANSPORTS:	CRITICAL CALLS:
1996 (flood)	389	194	63	5
1997	197	151	42	5
1998	189	104	52	0
1999	206	159	67	5
2000	218	162	63	5
2001	219	167	74	4
2002 (Jan-Nov actual)	202	157	74	4
2002 (projection)	220	167	81	4.4
5 yr average:	206	149	60	3.8

(1997-01)
- EMS Calls make up an average of 72% of total calls for emergency service.
- EMS calls result in a 40% transport rate.
- Critical EMS calls make up 2.5% of total EMS calls for emergency service.
- There have been no documented instances where a life is lost due to lack of ALS.
- Projections for 2002 averaged monthly calls and multiplied by 12.

APPENDIX E: **Page 2**

Analysis of Critical Calls and/or patients who may have benefited from ALS drugs for alleviation of pain or symptoms:

1997: 1 DOA: motorcycle rider dead of multi-systems trauma prior to our arrival

2 Cardiac cases which would have benefited from titrated lidocaine for PVC=s

1 crushing arm injury at mill who could have used morphine

1 cardiac case that could have used morphine

1998: No reported critical cases but...
2 cardiac responses that could have used morphine
1 DOA multi-systems trauma (last fatality on Birkenfeld corner)

1999: 2 DOA both of traumatic crushing

2 cardiac responses that could have used morphine

1 crushing leg injury who could have used morphine

1 COPD patient who could have used advanced airway medications

1 chest injury patient who is transported by Life Flight

2000: 1 cardiac DOA

1 Atrial Fib which could have benefited from cardioversion

3 Life Flight calls: 2 for trauma, 1 for extreme hypovolemia (she benefited from whole blood)

1 hip FX who could have used morphine

APPENDIX E: **Page 3**

2001: DOA, crushed skull on Cahill Corner

DOA MP 9 might have benefited from early defibrillation and advanced cardiac drugs

DOA at Mist might have benefited from early defibrillation and advanced cardiac drugs

DOA Crushing chest trauma

Mangled arm from dune buggy accident, Life Flight Transport

Logging accident: FX (tib-fib) could have used morphine

Notes:

1. I see a trend here. Patients represented in the charts I reviewed are either dead beyond recall or they are cardiac patients that need morphine or lidocaine or both before they arrest. As you know, currently an EMT-I in Oregon can only initially administer lidocaine when the patient is pulseless. We cannot administer morphine under any conditions.
2. The preponderance of Life Flight calls were not so much because they were going to need paramedic skills but that they needed fast transport to advanced surgical care.
3. I am not crazy about having to deal with the security requirements of carrying morphine, but this exercise has made me a believer in its usefulness for EMT-I's.

APPENDIX F:

Mist-Birkenfeld RFPD Internal Response Statistics - 1996 - 2002

EMS Critical Responses:

Year	Total Calls:	EMS Calls:	Transports:	Critical Calls:		% EMS Calls:	%Critical Calls:	Critical/Transports:
1996	389	194	63	5		49.9%	2.58%	7.94%
1997	197	151	42	5		76.6%	3.31%	11.90%
1998	189	104	52	0		55.0%	0.00%	0.00%
1999	206	159	67	5		77.2%	3.14%	7.46%
2000	218	162	63	5		74.3%	3.09%	7.94%
2001	219	167	74	4		76.3%	2.40%	5.41%
2002 (1/02-11102)	202	157	74	4		77.7%	2.55%	5.41%
2002 (Projected)	220	167	81	4.4		75.9%	2.63%	5.43%
5 year average:	205.8	148.6	59.6	3.8		72.2%	2.56%	6.38%
7 year average:	234.0	157.7	63.1	4.1		67.4%	2.57%	6.43%

	1997	1998	1999	2000	2001 Totals:	Annually:		Vs Transports
Deaths in the Field:	1	1	2	1	4	9	1.8	15.10%
Trauma:	1	1	2	0	2	6	1.2	10.07%
Other Causes:	0	0	0	1	2	3	0.6	5.03%
Where ALS Would Help:	4	2	5	5	4	20	4.0	33.56%
Trauma:	1	0	2	3	2	8	1.6	13.42%
Other Causes:	3	2	3	2	2	12	2.4	20.13%
Total ALS Impact:	5	3	7	6	6	27	5.4	45.30%
Trauma:	2	1	4	3	4	14	2.8	23.49%
Other Causes:	3	2	3	3	2	13	2.6	21.81%

APPENDIX G: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT

12525 Hwy. 202, Mist, OR 97016
(503)755-2710 or (503)755-0510
Fax (503)755-2556

EMS Program Survey

The purpose of this request for information is to help to develop a clear understanding of what other districts have done to implement their EMS programs. We are interested in the achieved level of service for program strengths, in

I. Level of Service

1. What is the highest level of emergency medical service generally provided by your Fire District?
   ALS ____ *ILS* ____ *BLS* ____
2. What percentage of the time is that level of service available?
   _____ *%*
3. How many concurrent incidents can you support at that service level using district personnel?
   ____ *INCIDENTS*
4. Is the highest level of service you provide available through mutual aid?
   YES ____ *NO* ____

II. Response Time

1. What is your average response time to an EMS incident?
   ____*MINUTES (90% OF THE TIME)*
2. What is the response time of the closest mutual aid company providing the same level of care?
   ABOUT ____ *MINUTES*
3. Does you agency operate under an organized Multiple Patient Protocol or Multiple Casualty Incident Protocol?
   YES ___ *NO* ___

APPENDIX G: **Page 2**

III. Personnel

1. How many of your personnel are certified at the following levels?
   ALS: ____ *PERSONNEL*
   ILS: ____ *PERSONNEL*
   BLS: ____ *PERSONNEL*

2. Does your agency support paid EMS Certified staff?
   YES ____ *NO* ____ *(IF NO, GO TO SECTION IV)*
3. What percentage of your EMS personnel are full time staff?
   ____ *% FULL TIME*
4. What percentage of your EMS personnel are part time paid staff?
   ____ *% PART TIME*
5. What is the current entry level salary for EMS Staff?
   *$*_____

6. What is the current average salary for your EMS Officer level staff?
   *$*_____

7. What is the average annual cost to your district to support one full time paid EMS staff person, including training, taxes, benefits and retirement?
   *$*_____

lV. Volunteer Personnel

1. What percentage of your EMS personnel are volunteers?
   _____ *% ARE VOLUNTEERS*
2. Do your volunteers receive an incentive for their participation?
   YES _____ *NO* _____
   If "yes", what is the form of incentive used? _____

3. What is the average annual cost to your district to support one volunteer EMS staff person, including training, taxes, benefits and retirement?
   *$*_____

APPENDIX G: **Page 3**

V. EMS Program Statistics

1. How many EMS calls did your agency respond to during 2001?
   _____ *CALLS*
2. What percentage are EMS calls of your total calls for service?
   _____ *% OF TOTAL CALLS WERE EMS*
3. What is the total population served by your EMS Program?
   _____ *IS TOTAL POPULATION SERVED*
4. What is the total area served by your EMS Program?
   _____ *SQUARE MILE*S
5. How many incorporated cities are served by your EMS Program?
   _____ *INCORPORATED CITIES*

APPENDIX H: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT
12525 Hwy. 202, Mist, OR 97016 (503)755-2710
Fax (503)755-2556

EMS Program Survey Results and Significance

The purpose of this request for information is to help to develop a clear understanding of what other districts have done to implement their district's mission in terms of EMS. Surveys were sent to surrounding district in both Columbia and Clatsop Counties and to several similar districts in rural Oregon. Each survey is followed by a telephone call to urge participation. Of the 25 surveys sent out 22 were returned completed. The received data were recorded in spreadsheet form. Questions requiring a yes/no were tallied as a percent of yes responses. Questions requiring quantification were tallied as averages.

I. Level of Service

1. What is the highest level of emergency medical service generally provided by your Fire District?
   ALS: 41% *ILS: 27%* *BLS: 32%*

2. What percentage of the time is that level of service available
   Total: *90 %* *ALS: 86%* *ILS: 86%* *BLS: 99%*

3. How many concurrent incidents can you support at that service level using district personnel?
   Total: 2.5 ALS: 2.4 ILS: 2.0 BLS: 3.0

4. Is the highest level of service you provide available through mutual aid? Total Yes: 73% ALS: 44% ILS: 100% BLS: 86%

Section I :

Section I attempts to create a baseline for the survey and determine the district's dept of coverage at that level. Question number one clearly identifies the highest level of service the fire district provides. Our data show that 41% of the districts sampled provide advanced life support service to their communities, 27% provide intermediate life support to their communities and 32% provide only basic life support to their communities. These data provide a baseline for our survey results.

Question number two identifies historically the ability of the district of provide service at that level. Our data show that for all districts surveyed the indicated level of service is available 90% of the time. For districts providing both ALS and ILS the data show that the indicated level of service is available 86% of the time. For districts providing BLS the data show that the indicated level of service is available 99% of the time.

APPENDIX H: **Page 2**

Question number three attempts to determine the depth of service available at the indicated level of service. The number of incidents that can be covered concurrently is determined by the number of certified personnel available, by the number of appropriate apparatus available and by the number of like units staffed with like personnel available through mutual aid. Our data show that 2.5 calls could be covered at the indicated level of service for all districts sampled, 2.4 calls could be covered at the indicated level of service for all ALS districts sampled, 2 calls could be covered at the indicated level of service for all ILS districts sampled and 3 calls could be covered at the indicated level of service for all BLS districts sampled.
Question number four confirms mutual aid coverage from another district at the indicated service level. Our data show that for all districts surveyed mutual aid is available at the indicated level of service 73% of the time. For districts providing ALS mutual aid is available at the indicated level of service 44% of the time, for districts providing ILS the data show that the indicated level of service is available 100% of the time and for districts providing BLS the data show that the indicated level of service is available 86% of the time.

II. Response Time

1. What is your average response time to an EMS incident?
   Total: 6.5 ALS: 5.7 ILS: 8.2 BLS: 6.4

2. What is the response time of the closest mutual aid company providing the same level of care?
   Total: 13.0 ALS: 12.0 ILS: 14.6 BLS: 12.7

3. Does you agency operate under an organized Multiple Patient Protocol or Multiple Casualty Incident Protocol?
   TOTAL YES: 73% ALS: 89% ILS: 83% BLS: 43%

Section II:

Section II attempts to quantify response times related to levels of service provided as well as whether planning and training have been extended to responding to catastrophic events. Question one quantifies each of the survey participant's response times to EMS incidents. Our data show that for all districts surveyed response time averaged 6.5 minutes from the time the call for help is answered. For districts providing ALS average response times is 5.7 minutes, for districts providing ILS the data show that response times averaged 8.2 minutes and for districts providing BLS the data show that response times averaged 6.4 minutes.

APPENDIX H: **Page 3**

III. Personnel

1. How many of your personnel are certified at the following levels?

	Total:	ALS:	ILS:	BLS:
ALS:	*5.1*	*11.1*	*2.5*	*0.0*
ILS:	*2.8*	*3.4*	*5.2*	*1.0*
BLS:	*12.8*	*14.4*	*9.2*	*9.2*

2. Does your agency support paid EMS Certified staff?
   TOTAL YES: 55% ALS: 67% ILS: 83% BLS: 0%

3. What percentage of your EMS personnel are full time staff?
   Total: 43% ALS: 61% ILS: 7% BLS: 0%

4. What percentage of your EMS personnel are part time paid staff?
   Total: 2% ALS: 2% ILS: 0% BLS: 0%

5. What is the current entry-level salary for EMS Staff?
   Total: $39166 ALS: $40479 ILS: $35572 BLS: $0

6. What is the current average salary for your EMS Officer level staff?
   Total: $48928 ALS: $50800 ILS: $37800 BLS: $0

7. What is the average annual cost to your district to support one full time paid EMS staff person, including training, taxes, benefits and retirement?
   Total: $61523 ALS: $67912 ILS: $48996 BLS: $0

lV. Volunteer Personnel

1. What percentage of your EMS personnel are volunteers?
   Total: 68.1% ALS: 42.8% ILS: 94.0% BLS: 78.8%

2. Do your volunteers receive an incentive for their participation?
   TOTAL YES: 59% ALS: 78% ILS: 83% BLS: 14%

Form: LOSAP:	9%	20%	0%	0%
$ per call:	36%	40%	21%	0%
Points/call:	14%	20%	16%	0%
Stipend:	9%	0%	33%	0%
Sleeper $:	5%	10%	0%	0%
Reimb:	23%	20%	33%	14%

3. What is the average annual cost to your district to support one volunteer EMS staff person, including training, taxes, benefits and retirement? Total: $1367 ALS: $1687 ILS: $1300 BLS: $614

APPENDIX H: **Page 4**

V. EMS Program Statistics

1. How many EMS calls did your agency respond to during 2001?
   Total: 595 ALS: 886 ILS: 219 BLS: 409

2. What percentage are EMS calls of your total calls for service?
   Total: 73% ALS: 68% ILS: 55% BLS: 70%

3. What is the total population served by your EMS Program?
   Total: 11473 ALS: 15917 ILS: 5258 BLS: 8114

4. What is the total area served by your EMS Program?
   Total Sq.Miles: 191 ALS: 296 ILS: 108 BLS: 363

5. How many incorporated cities are served by your EMS Program?
   Total: 1.0 ALS: 1.6 ILS: 0.5 BLS: 0.6

APPENDIX I: SECTION 1: LEVEL OF SERVICE

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY **Conducted During October, 2002**

All Providers					BLS Providers				ILS Providers				ALS Providers			
I. Level of Service Question #:	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Survey #: 1	1 a	99.9	5	yes									1 a	99.9	5	yes
2	1a	100	3	no									1a	100	3	no
3	la	100	3	yes	1a	100	3	yes								
4	1a	40	0	no									1a	40	0	no
5	1a	80	2	yes					Ia	80	2	yes				
6	1a	10	2	no	1a	100	2	no								
7	1a	90	2	yes									1a	90	2	yes
8	1 a	100	2	yes									1a	100	2	yes
9	1a	63	2	yes					1a	63	2	yes				
10	la	100	3	yes									la	100	3	yes
11	1a	100	2	yes					la	100	2	yes				
12	1a	99	2	yes					1a	99	2	yes				
13	la	100	5	yes	la	100	5	yes								
14	la	100	3	no									1a	100	3	no
15	la	98	4	yes	1a	98	4	yes								
16	la	100	2	yes	1a	100	2	yes								
17	la	80	2	yes					1a	80	2	yes				
18	la	40	0	no									1a	40	0	no
19	la	100	3	yes	la	100	3	yes					1a	100	4	no
20	la	100	2	yes	1a	100	2	yes								
21	la	100	4	no												
22	1a	95	2	yes					la	95	2	yes				
	22	90%	2	73%	7	98.7°	3	86%	6	86%	3	100%	9	85.54	2."	0.44
					32%				27%				41%			

APPENDIX I: **Section 2: Response Time**

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY **Conducted During October, 2002**

All Providers:				BLS Providers			ILS Providers			ALS Providers		
Question #:	1	2	3	1	2	3	1	2	3	1	2	3
Survey #: 1	5.8	7.0	yes							5.8	7.0	yes
2	5.0	15.0	yes							5.0	15.0	yes
3	0.3	15.0	no	7.0	15.0	no						
4	7.0	12.0	yes							6.2	12.0	yes
5	8.0	10.0	yes				8.0	10.0	yes			
6	7.0	13.0	yes	7.0	13.0	yes						
7	3.5	10.0	no							3.5	10.0	no
8	6.0	15.0	yes							6.0	15.0	yes
9	10.0	17.5	yes				10.0	17.5	yes			
10	8.0	15.0	yes							8.0	15.0	yes
11	8.0	15.0	yes				8.0	15.0	yes			
12	8.0	20.0	yes				8.0	20.0	yes			
13	8.0	15.0	yes	5.0	15.0	yes						
14	6.0	10.0	yes							6.0	10.0	yes
15	5.0	5.0	no	5.0	5.0	no						
16	6.0	8.0	no	6.0	8.0	no						
17	7.0	10.0	yes				7.0	10.0	yes			
18	6.2	12.0	yes							6.2	12.0	yes
19	8.0	14.0	no	8.0	14.0	no						
20	7.0	20.0	yes	7.0	20.0	yes						
21	4.5	12.0	yes							4.5	12.0	yes
22	8.0	15.0	no				8.0	15.0	no			
	6.47	12.98	0.73	6.43	12.86	0.43	8.17	14.58	0.83	5.69	12.00	0.89

APPENDIX I: **Section 3A: Personnel**

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY

Conducted During October, 2002

All Providers:

BLS Providers

Question#:	1a	1b	Ic	2	3	4	5	6	7	1a	1b	1c	2	3	4	5	6	7
Survey* 1	20	2	20	yes	95	5	47028	61000	67000									
2	14	0	3	yes	100	0	35273	45000	75000									
3	0	0	20	no	na	na	na	na	na	0	0	20	na	na	na	na	na	na
4	2	3	15	no	na	na	na	na	na									
5	4	4	7	yes	5	0	40020	na	50000									
6	0	2	5	no	na	na	na	na	na	0	2	5	no	na	na	na	na	na
7	9	5	7	yes	38	0	40488	na	75000									
8	8	0	6	yes	60	7	37464	43248	52000									
9	1	2	5	yes	12	0	29124	na	31000									
10	5	5	18	yes	20	0	40000	47500	85000									
11	0	6	15	yes	10	0	na	37800	60480									
12	0	5	1	no	na	na	na	na	na									
13	0	3	40	no	na	na	na	na	na	0	3	40	no	na	na	na	na	na
14	22	7	18	yes	66	0	45600	62400	67300									
15	0	0	11	no	na	na	na	na	na	0	0	11	no	na	na	na	na	na
16	0	2	6	no	na	na	na	na	na	0	2	6	no	na	na	na	na	na
17	5	7	10	yes	5	0	na	na	50000									
18	2	4	14	no	na	na	na	na	na									
19	0	0	22	no	na	na	na	na	na	0	0	22	no	na	na	na	na	na
20	0	0	18	no	na	na	na	na	na	0	0	18	no	na	na	na	na	na
21	15	0	4	yes	100	0	37500	45550	72000									
22	5	4	17	yes	4	0	0	0	53500									
	5.1	2.8	12.8	55%	43%	1.71	39166	48928	61523	0_0	1.0	17.4	0%	0/0	0.00	0.00	0,,00	0__0

APPENDIX I: **Section 3B: Personnel**

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY

Conducted During October, 2002

ILS Providers

Question#:	la	1b	Ic	2	3	4	5	6	7
Survey #: 1									
2									
3									
4									
5	4	7	7	yes	5	0	40020	na	50000
6									
7									
8									
9	1	2	5	yes	12	0	29124	na	31000
10									
11	0	6	15	yes	10	0	na	37800	60480
12	0	5	1	no	na	na	na	na	na
13									
14									
15									
16									
17	5	7	10	yes	5	0	na	na	50000
18									
19									
20									
21									
22	5	4	17	yes	4	0	0	0	53500
	2.5	5.2	9.2	83%	7%	0%	34572	37800	48996

ALS Providers

Question#:	1a	1b	Ic	2	3	4	5	6	7
Survey #: 1	20	2	20	yes	95	5	47028	61000	67000
2	14	0	3	yes	100	0	35273	45000	75000
3									
4	2	3	15	no	na	na	na	na	na
5									
6									
7	9	5	7	yes	38	0	40488	na	75000
8	8	0	6	yes	60	7	37464	43248	52000
9									
10	5	5	8	yes	20	0	40000	47500	85000
11									
12									
13									
14	22	7	18	yes	66	0	45600	62400	67300
15									
16									
17									
18	2	4	14	no	na	na	na	na	na
19									
20									
21	15	0	4	yes	100	0	37500	45550	72000
22									
	10.8	2.9	10.6	78%	68%	2%	40479	50783	70471

APPENDIX I: **Section 4: Volunteer Personnel**

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY

Conducted During October, 2002

	All Providers				BLS Providers				ILS Providers				ALS Providers			
Question ;	1	2	2A	3	1	2	2A	3	1	2	2A	3	1	2	2A	3
Survey #:	50	yes	pt; is	5000									50	yes	pt; Is	5000
2	10	yes	PC $6	1000									10	yes	pc $6	1000
3	50	no	na	na	50	no	na	na								
4	50	no	na	300									50	no	na	300
5	95	yes	PC	1000					95	yes	pc	1000				
6	100	no	na	600	100	no	na	600								
7	62	yes	a	3000									62	yes	Pt	3000
8	40	yes	pc	680									40	yes	pc $4	680
9	88	yes	at	unk					88	yes	t	unk				
10	80	yes		2500									80	yes pc $15;si $20;		2500
11	90	yes	a; 51	3000					90	yes	pt; st	3000				
12	100	no	rta	100					100	no	na	100				
13	100	no	na	150	100	no	na	150								
14	33	yes	pore	1000									33	yes	pore	1000
15	100	yes	re	1000	100	yes	re	1000								
16	100	no	na	750	100	no	na	750								
17	95	yes	pc:re	1200					95	yes	pc:re	1200				
18	50	no	ne	600									50	no	ne	600
19	50	no	ire	na	50	no	na	na								
20	50	no	na	1800	50	no	na	1800								
21	10	yes	pore	1100									10	yes	pc;re	1100
22	96	yes	pc;re	1200					96	yes	pc;re	1200				
	68%	59%		1367	79%	14%		$614	94%	83%		1300	43%	78%		1687

2A Codes =: Is = LOSE pc = $ per ca pt = points pert st = stipend si = sleeper duty re = reimbursement

APPENDIX I: **Section 5: EMS Statistics**

EMERGENCY MEDICAL SERVICE PROGRAM SURVEY

Conducted During October, 2002

	All Providers					BLS Providers					ILS Providers					ALS Providers				
Question ;	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Survey #:	1915	67	25500	200	4											1915	67.2	25500	200	4
2	1019	60	22000	1000	0											1019	60	22000	1000	0
3	1020	86	20000	140	1	1020	86	20000	140	1										
4	426	62	10500	12	1											426	62	10500	12	1
5	292	65	8000	150	1						292	65	8000	150	1					
6	169	88	3000	150	1	169	88	3000	150	1										
7	762	66	11000	100	1											762	66	11000	100	1
8	350	87	4250	3	0											350	87	4250	3	0
9	100	85	3000	21	1						100	85	3000	21	1					
10	450	70	8000	150	1											450	70	8000	150	1
11	289	77	1350	165	0						289	77	1350	165	0					
12	140	48	1200	28	0						140	48	1200	48	0					
13	380	75	5000	200	0	380	75	5000	200	0										
14	1500	72	25000	185	5											1500	72	25000	185	5
15	76	68	4000	21	0	76	68	4000	21	0										
16	177	90	2800	122	1	177	90	2800	122	1										
17	311	68	9000	165	1						311	68	9000	165	I					
18	455	62	12000	10	1											455	62	12000	10	1
19	988	86	22000	110	1	988	86	22000	110	1										
20	890	86	17800	135	0	50	no	na	1800											1
21	1100	65	25000	1000	1											1100	65	25000	1000	
22	280	70	12000	140	1						280	70	12000	140	1					
	595	73%	11473	191.2	1.0	409	82%	8114	363.3	0.6	235.3	69%	5758	114.8	0.7	886.3	68%	15917	295.6	1.6

APPENDIX J: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT
12525 Hwy. 202, Mist, OR 97016 (503)755-2710
Fax (503)755-2556

Emergency Medical Service Level Survey

Circle Your Selection:

1. What level of Emergency Medical Service does the Mist-Birkenfeld RFPD currently provide?

   Advanced Life Support
   Intermediate Life Support
   Basic Life Support

2. Does this level of emergency medical service meet your needs or expectations?

   Yes
   No

3. We have had a number of requests for Advanced Life Support service. What level of additional property tax would you be willing to pledge in support of this improvement in service?

   $1.63 per $1000 valuation ($163 per year on a $100,000 home)
   (ALS available 24 hours/7 days per week)

   $ .70 per $1000 valuation ($ 70 per year on a $100,000 home)
   (ALS available about 20% of the time)

   $ .20 per $1000 valuation ($ 20 per year on a $100,000 home)
   (ALS available in 7 to 10 years through attrition)

   $ 0.00 no change in tax rate
   (Continue with ILS service that is now available)

4. Have you ever called 911 for a medical emergency in the Mist-Birkenfeld fire district?

   Yes
   No

5. How would you rate the emergency medical service provided by your fire district?

   Excellent
   Very Good
   Good
   Fair
   Poor

Thank you for completing the survey! If you have additional comments you are welcome to use the space on the back of the form.

APPENDIX J: **Page 2**

COMMENTS:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Note: Please fold between the dotted lines below and tape with Scotch tape. Be sure the address and stamp are clearly visible. Thanks!

……
……
……
……

Stamp

Mist-Birkenfeld Rural Fire Protection District
12525 Highway 202
Mist, Oregon 97016

APPENDIX K: **Page 1**

Community Survey Results

Question	1	2	3A	3B	3C	3D	4	5A	5B	5C	5D	5E
Survey #:												
1	1	Y				$0.00	Y	E				
2	I	Y				$0.00	Y	E				
3	I	Y				$0.00	N		V			
4	I	Y				$0.00	N	E				
5	I	Y				$0.00	N		V			
6	1	Y				$0.00	Y		V			
7	B	Y				$0.00	Y	E				
8	I	Y	$1.63				Y	E				
9	I	Y				$0.00	Y	E				
10	B	Y				$0.00	Y			G		
11	I	Y				$0.00	Y	E				
12	B	Y				$0.00	N				F	
13	I	Y			$0.20		N	na	na	na	na	na
14	I	Y				$0.00	Y	E				
15	1	Y			$0.20		N	E				
16	B	Y				$0.00	N			G		
17	I	Y		$0.70			Y		V			
18	I	Y				$0.00	Y	E				
19	I	Y				$0.00	N	na	na	na	na	na
20	I	Y				$0.00	Y	E				
21	I	Y				$0.00	Y	E				
22	I	Y				$0.00	N	na	na	na	na	na
23	1	Y				$0.00	Y	E				
24	I	Y		$0.70			Y		V			
25	B	Y				$0.00	N			G		
26	I	Y			$0.20		N	E				
27	I	Y	na	na	na	na	N	E				
28	I	Y				$0.00	N		V			
29	I	Y				$0.00	N	E				
30	I	Y			$0.20		N		V			
31	1	Y				$0.00	Y		V			
32	I	Y				$0.00	Y	E				
33	I	Y	$1.63				Y	E				
34	1	Y				$0.00	Y	E				
35	B	Y				$0.00	Y			G		
36	1	Y				$0.00	Y	E				
37	B	Y				$0.00	N				F	
38	1	Y			$0.20		N	na	na	na	na	na
39	I	Y				$0.00	Y	E				
40	I	Y				$0.00	Y	E				
41	I	Y				$0.00	N		V			
42	1	Y				$0.00	N		V			

APPENDIX K:

Community Survey Results

43	B	N		$0.70			N	na	na	na	na	na
44	1	Y		$0.70			N		V			
45	1	Y				$0.00	Y	E				
46	I	Y				$0.00	N	E				
47	I	Y			$0.20		Y	E				
48	B	Y				$0.00	Y	E				
49	B	Y			$0.20		N	E				
50	B	Y				$0.00	N			G		
51	I	Y			$0.20		N	E				
52	1	Y				$0.00	N	na	na	na	na	na
53	I	Y				$0.00	Y	E				
54	I	Y				$0.00	Y	E				
55	I	Y	$1.63				Y	E				
56	1	Y				$0.00	Y	E				
57	I	Y				$0.00	Y		V			
58	1	Y			$0.20		N		V			
59	B	Y				$0.00	Y			G		
60	B	Y				$0.00	N	na	na	na	na	na
61	1	Y	na	na	na	na	y	E				
62	1	Y				$0.00	N		V			
63	I	Y			$0.20		N	na	na	na	na	na
64	I	Y		$0.70			N	NA	NA	NA	NA	NA
65	1	Y			$0.20		N	E				
66	I	Y				$0.00	N	E				
67	B	N	$1.63				N					
68	I	Y			$0.20		Y	E				
69	1	Y				$0.00	N	E				
70	I	Y					N		V			
71	I	Y				$0.00	Y	E				
72	NA	NA				$0.00	N					
73	1	Y				$0.00	Y	E				
74	I	Y				$0.00	N		V			
75	1	N	$1.63				N		V			
76	I	Y				$0.00	Y	E				
77	1	Y				$0.00	N			G		
78	1	Y			$0.20		Y	E				
79	I	Y				$0.00	N	E				
80	I	N	$1.63				N		V			
	99.00%	96.00%	0.08%	0.06%	0.16%	0.70%	52.38%	0.60%	0.25%	0.11%	0.04%	0.00%
			Option 1	Option 2	Option 3	Option 4						

LS: Assigning a value of 3 to 3A, 2 to 3B,1 to 3C and 0 to 3D, the value derived would be: 0.56
Assigning a value of 4 for 5A, 3 for 5B, 2 for 5C, I for 5D, and 0 for 5E, the value derived would be: 3.58

APPENDIX L: Page 1

Comments Received from Emergency Medical Service Level Survey

Comment #:	Survey #:	Comments:
1	2	We are not property owners.
2	8	Excellent department!
3		The community needs the service.
4		This is a very isolated area, it is difficult to get help from outside.
5		Having ALS available will give the community a feeling of security.
6	13	Unsure of quality of service (question 5 unanswered).
7	19	Not sure about question 5 (unanswered).
8	26	I have heard of no complaints
9	27	Thank You!
10	28	We are not property owners, should not answer this (question 3).
11	30	I have heard of no complaints
12	31	People are struggling now, but the need is real.
13		The level of service received is fairly normal for a rural area.
14	33	Excellent FD. Located in an area easily isolated. Need the care.
15		We are located in an area easily isolated, we need the services here.
16		We (the community) need the higher level of care.
17	36	We are satisfied the current level of service.
18		If we wanted a higher level of service we would live in a city.
19	37	Have Fire-Med/Life-Flight (subscription through fire district).
20		Fire district costs are too high.
21	39	NO, no, no, no, no change!!!

Comment #:	Survey #:	Comments:
22	43	New resident. Cannot comment on quality of service (no answer for question 5).
23	46	An improvement to ALS will likely lead to more dependence on government services.
24		The volunteers are already over-worked, why add more to their lives?
25	47	Create a self-sustaining account using these taxes. Hire after account is self-sustaining.
26	50	Pay Chief much less. Pay Asst Chief & Admin Asst more. Chief's wage is not justified.
27	52	When will tax increases stop? We have not had a wage increase in 5 years+.
28	54	Excellent!!! Keep up the excellent work!
29	55	We vote to pay for a helping hand to take pressure off of overworked staff.
30	58	More blankets
31	59	Don't know quality of service no answer on question 5).
32	60	My wife needed to be transported to hospital. Your service, care and help is great!
33	62	I don't know about quality of service (no answer on question 5).
34	70	I'm a renter (no answer for question 3).
35		So far, so good! (question 5)
36	71	"It is desirable to have advanced life support but the extra taxes at this time is a concern"
37	73	How many patients lost from lack of ALS? I checked the records. None.
38	75	It is worth the expense.
39		Just arrived in the area and planned to see if ALS could be provided so the survey is well timed.
40	76	Can't afford the taxes now.
41	77	ALS would only work if you could reduce response time. Area you cover too large.
42	80	It is worth the expense

APPENDIX M: Page 1

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT

12525 Hwy. 202, Mist, OR 97016
(503)755-2710 or (503)755-0510
Fax (503)755-2556

Fire Chief's Report

Metro-West Service Proposal

June 27, 2000

To the Board of Directors, M-B RFPD:

As you know, staff has been looking into the possibility of obtaining paramedic service for the citizens here in the fire district. Metro-West Ambulance responded to our search for paramedics with a proposal to provide those services (attached). I spoke to Henry Heimuller of Metro-West Ambulance about the details of his company's offer. The offer includes the assumption that Metro-West would assume billing rights for all medical transports. This makes the offer slightly less attractive due to the loss of revenue that would result.

I have looked into the conditions and our ability to support the service this proposal would provide. The findings are contained below.

WHAT THE FIRE DISTRICT WOULD RECEIVE:

1. Their proposal is to provide one certified paramedic, covering the district 24-hours per day, 7 days per week, on an on going basis.

WHAT THE FIRE DISTRICT WOULD NEED TO PROVIDE:

1. One ALS supplied and licensed ambulance.
2. ALS equipment (Life-pack 12, intubation equipment, etc.).
3. A driver, fuel and maintenance for the ambulance.
4. ALS medications and supplies.
5. A second certified EMT, on call, 24 hours per day, 7 days per week.
6. Living quarters for one paramedic on site.
7. All rights to patient billing. (Approximately $12,000 annually)
7. Funds equal to an hourly rate of $22.10 per hour. *

(* It is unclear what the final negotiated cost would be.)

APPENDIX M: Metro-West Proposal Page 2

BENEFITS TO THE FIRE DISTRICT:

- ALS available in district for first call, 24 hours per day, 7 days per week.
- No training expenses for paramedics.
- Probable service as EMS instructor while standing by.

CONCERNS:

- Funding the personnel. (No funding exists to support this program)
- Funding the equipment. (No budgeted funds for equipment)
- Funding the living quarters. (No resources currently exist)
- Loss of funding from EMS transport billing. (About $12,000 per year)
- Volunteer reaction. (Apathy, loss of interest, passive aggressive?)
- Community reaction to increased cost. (Tax increase opposition)
- Confusion in operational authority, on scene and in quarters.
- Confusion in operational responsibility.

Confusion with authority and with responsibility are training issues and can be solved with time and training. However, volunteer reaction is a troubling unknown. Our personnel are very dedicated and dependable. Conventional wisdom, both in the literature and as obtained through trusted, experienced advisors, indicates that as call volume falls off volunteer interest wanes. Staff is very concerned that this trend may set in as a result of contracting for ALS service.

ANOTHER OPTION:

The other option is to hire ALS personnel and to operate the program completely in-house. In terms of funds to operate the program internally, the annual cost would be slightly less than the annual cost of contracting certified personnel and importing the program. This option also has the benefit of supporting employees who would be required to live in the fire district.

APPENDIX M: Metro-West Proposal Page 3

The real issue, whether contracting with Metro-West or providing ALS in-house, is funding. There is no possibility, given current tax revenues and the state of our budget, that we can fund a move to ALS without passing a "Local Option" operating levy. Currently the cost to the taxpayers would be approximately an additional $2.50 per $1000 of property valuation. That would more than double the current rate of $2.0875 per thousand.

One suggestion that was posed by Dave Dickens of N.W. Resource Conservation and Development was to seek out grant funds for the project. The problem with using grant funds to operate an ongoing program is that, assuming you are successful, once you get the program up and running the grant funds will probably disappear. If that occurs the district would be in worse shape, financially and politically, than we are at present.

Considering the above, and the current economic state of the area, I recommend that we do not pursue the Metro-West proposal at this time.

Respectfully Submitted,

Chief Dave Crawford

APPENDIX M: **Metro-West Proposal** **Page 3**

COST TO STAFF AND EQUIP ONE AMBULANCE FOR ALS AT MIST-BIRKENFELD RFPD

Cost of equipment, supplies and rolling stock:

1.	ALS capable Ambulance: Medic 461 will work fine, no additional cost to district.	
2.	Equipment: Life Pack 12 (or equivalent)	$ 8500.00
3.	ALS-specific equipment	1050.00
4.	ALS specific kit and initial medical stock	1036.14
	Initial equipment and supplies for startup:	$10,586.14

Cost of each full time paramedic employee (see salary study):	$60,027.00
Number of employees required for 24/7 coverage:	3.5 FTE
Total cost of employees: (3.5 X $60,027.00)	$210,095.00

Estimated cost of training maintenance per employee:	$ 2,000.00
Total cost of training for 24/7 paramedic coverage:	7,000.00

Cost of 3.5 FTE, paramedic certified:	$210.095.00
Cost of equipment and supplies:	10,586.14
Cost of training annually:	7,000.00
Total Cost of improving EMS service to 24/7 ALS:	$227,681.14

APPENDIX N: **Page 1**

ADDITIONAL COST TO IMPLEMENT AN ALS PROGRAM

(Source: Research completed by D.C. Ann Berg.)

Apparatus and Equipment Cost (start-up):

Category:	Items:	Required:	Cost Each:	Total Cost:	Add'l Resources Req'd:
1	Ambulance	1 (min)	$96,000	$96,000	$0.00 (see note A)
	Equipment:				
2	Life Pack 12	1 refurb.	$ 8.500	$8,500	
3	Other ALS Equ.	1 each	$ 1,050	$1,050	
4	ALS Jump Kit	1 (min)	$ 1036	$1,036	
	Total Required for Initial Start-up:			$ 10,586	$0.00 (see note B)

Cost of Personnel (annually):

(Sources: Local study completed May 2000 by Chief Crawford and EMS Program Survey results.)

Personnel:	Paramedic (local study)	each	$60,027
	Paramedic (survey results)	each	$70,471
	Used local cost study		
	Total Cost for each Paramedic:		$ 60,027

Additional Cost of Option 1 (identified in Emergency Medical Service Level Survey):

Personnel:	Total Cost of 3.5 Personnel:	$210,095

Additional Cost of Option 2 (identified in Emergency Medical Service Level Survey)**:**

Personnel:	Total Cost of one Employee:	$ 60,027	
Overtime:	940 Hours annually:	$ 30,014	
	Total Cost of Personnel:		$ 90,041

Additional Cost of Option 3 (identified in Emergency Medical Service Level Survey)**:**

Personnel:	Total cost of 2 ALS Certification Bonus'	$ 30,000

Additional Cost of Option 4 (identified in Emergency Medical Service Level Survey)**:**

Personnel:	No Additional Cost:	$ 0

Note A: Both current ambulances owned by the fire district are functional for ALS operation

Note B: The fire district has identified resources to offset this cost.

APPENDIX N: **Page 2**

COST OF OPTIONS CONVERTED TO TAX RATE CHANGE:

Property tax rates are set by a constitutional limit in the State of Oregon. The constitutionally limited permanent tax rate for Mist-Birkenfeld RFPD is:

$ 0.0020875, or $ 2.0875 per $1000 of assessed property valuation.

Additional operating funds can only be generated by passing a local option tax measure in the State of Oregon. Local option levies are limited to 5-year maximum duration and require a double majority (50% plus one voter in favor plus 50% plus 1 voter turn out) except at general elections.

When considering the effect of a local option levy on the property owners of the district, a rate representing the additional taxes to be imposed can be produced by dividing the total additional funds required by the total assessed valuation of the fire district. The resulting number is customarily expressed as it applies to each $1000 of property valuation. For example, a rate of 0.0020875 is expressed as $2.0875 per $1000 of assessed value.

Converting the Cost of Each Option to a Tax Rate:

Option #:	District Assessed Value:	Funds Needed:	Rate per $1000:
1	$128,835,000	$210,000	$ 1.63
2	$128,835,000	$ 90,000	$ 0.70
3	$128,835,000	$ 30,000	$ 0.25
4	$128,835,000	$ 0	$ 0.00

APPENDIX N: **Page 3**

COST STUDY FOR ADDITION OF ALS EMERGENCY MEDICAL PROGRAM
Cost of Personnel:
Districts polled: Tualatin Valley Fire & Rescue (TV F&R)
Clatskanie RFPD (CRFPD)
Hood River Fire & Rescue (HRRFPD)
Date Polled: May 5, 2000

Monthly Cost Estimate:

Agency:	Salary:	Federal:	State:	PERS:	Health:	Total Cost:
TVF&R	$4302.00	$1314.74	$354.85	$873.14	$565.00	$5851.01
CRFPD	$3596.00	$1112.13	$297.02	$746.48	$565.00	$5002.27
HRF&R	$3310.00	$1030.17	$273.59	$695.18	$565.00	$4658.45

Annual Cost Estimate:

Agency:	Salary:	Federal:	State:	PERS:	Health:	Total Cost:
TVF&R	$51624.00	$4250.65	$584.04	$6973.44	$6780.00	$70212.13
CRFPD	$43152.00	$3634.05	$499.32	$5961.88	$6780.00	$60027.25
HRF&R	$39720.00	$3384.27	$465.00	$5552.10	$6780.00	$55901.38

Federal column includes cost of SSI and Medicare
State column includes Unemployment
PERS column includes employer portion of PERS (Public Employee Retirement System)
Health Column includes employer paid health care costs.

APPENDIX N: **Page 4**
COMPARISON OF HIRING PERSONNEL VS. CONTRACTING

Metro-West Ambulance has submitted a bid to provide paramedics for the fire district on a 24 hour per day 7 day per week basis. The bid price was $24.15 per hour, which translates to $211,554 annually. These Paramedics would be cross-trained as firefighters, which would be of benefit to the district as well. There are some definite advantages in contracting. There are no recruiting or hiring processes to organize. There are no employee records to keep or payroll to process. In addition, discipline is relatively easy compared to the requirements imposed by an employer/employee relationship.

The fire district is able to hire firefighter/paramedics at a total cost of $21.43 per hour. It would require a minimum of three and perhaps as many as 3.5 employees (to cover vacations and sick days) to put one paramedic in district on a 24/7 basis. Our cost to do that as an employer is $210,095 annually. Additional benefits include the hiring locally or requiring in-district residence. There is also the loyalty and pride that is developed in an employee of a rural fire district.

Additionally, there is an opportunity to partner with Clatskanie RFPD to create an employee pool. This would reduce our overhead cost and would assure the paramedics were getting good experience through regular station rotation.

Living quarters would need to be constructed or placed for one in-house employee or for one contract employee. I have not researched the cost, but it would be significant. Because the cost is actually less to hire internally, and because I believe that ultimately a contract employee will not become invested in the local community, I recommend that should resources become available to fund full time ALS the M-B RFPD recruit and hire employees. I further recommend that the district politely decline Mr. Fuiten’s offer.

APPENDIX N: **Page 5**

METRO-WEST Ambulance
Since 1953
PO Box 1635
Hillsboro, Oregon 97123-1635
(503)648-6658

To: Chief Dave Crawford
Mist-Birkenfeld
R.F.P.D. 12525 HWY
202 Mist, OR 97016

Re: Proposal for Paramedic

Services Dear Chief Crawford,

This letter and proposal is sent to respond to your conversation yesterday with our Supervisor Henry Heimuller. As you are aware, you asked if Metro West would be interested in submitting a bid to provide MBRFPD with 24 hour per day Paramedic coverage. The following is our proposal to your request. Henry also said that you stated that having these personnel cross- trained as firefighters would potentially be a benefit to your department, and it would certainly be possible for us to provide personnel trained for these duties. It is also possible that we could assist you in ambulance billing and collections to maximize your collections to help offset the costs of providing Advanced Life Support to the citizens of your district.
This proposal assumes the following:

1. The Metro-West Paramedic would be provided living quarters at the fire station.
2. MBRFPD will provide and maintain the ambulance and all equipment needed to provide advanced life support service to the extent of the local medical protocols.
3. MBRFPD will provide an EMT, whether paid or volunteer, to complete the ALS crew.
4. Details as they relate to protocols, insurance, physician advisor etc. will be addressed at a later time.
5. Metro-West Ambulance Service will provide one state certified Paramedic 24 hours per day, 7 days per week.

The cost for providing this level of service would be $24.15 per hour for a total of $211,554.00 per calendar year.
Please feel free to contact us with any questions you may have regarding this proposal, or optional services we may provide.

J.D. Fuiten, President

"Meeting Each Customers Needs."

APPENDIX O: **Page 1**

(Text only: Cover letter from Oregon State EMS Director Jonathan Chin)
November 26, 2002

Dear EMT Intermediate Provider Agency:

Greetings from the EMS Office! We would like to request your assistance in completing the enclosed survey and in encouraging your EMT Intermediates to complete their provider survey.

The state EMS and Trauma Systems Section along with Oregon Board of Medical Examiners is conducting a survey on both the use and the scope of practice of EMT Intermediates in the State of Oregon. The purpose of the survey is to look at where and how Intermediates are being used, as well as the patient skills and medications that are being administered in the field. There have been several proposals made to change the Intermediate program. Unfortunately, there is not a statewide database to provide us with the information needed to determine what the specific and appropriate changes to be made are. We need your insight and experience as an Oregon Intermediate Provider Agency to help identify those changes - the information you provide in this survey will drive the decision making process.

There is potential for significant changes in practice and policy; changes which would directly affect you as an agency, your Intermediates, and us as a state EMS system. Your participation is important! Every EMT Intermediate and Intermediate Provider Agency in the state is receiving a survey. We have an ambitious goal of 90% participation! Your participation and encouragement to your Intermediates is much appreciated. A postage paid return envelope has been provided or you may return it by fax: 503-731-4077.

A comment regarding the survey: we realize that some of your answers will be to the best of your knowledge or your best estimate - we recognize this and will take that into consideration.

Thanks again for your support and participation. If you have any questions, please feel free to contact me at j.chin@,state.or.us or 503-731-4011.

Appreciatively,

Jonathan Chin State EMS Director

APPENDIX O: **Page 2**

EMT Intermediate Agency Survey (12/02)

Demographic Information:
Name of organization:_____
Location of organization:
Approximate population of your service area: _____
Approximate square miles in your service area:
How would you describe your agency: Paid / Volunteer / Combined
How would you describe the area you serve: Urban / Suburban / Rural / Frontier / Wilderness

Distance to nearest hospital from primary Station in miles: _____ In time: _____
What percentage of your transports go this hospital? _____
Average number of medical calls your agency responds to per year:_____
Average number of calls your agency provides ILS or ALS intervention on per year:
Estimate of the number of times per year ALS is provided by a EMT-Paramedic: _____
Estimate of the number of times per year ILS is provided by an EMT-Intermediate:
Number of Intermediates and Paramedics in your organization: I = _____ / P =
Briefly explain why your agency use Intermediates?
(please use reverse side of this page to explain)
What are the five (5) most common ILS skills/drugs used by your Intermediates
(please list them on the reverse side of this page)
Does your agency provide Intermediate level continuing education offerings? Yes / No Is intermediate level continuing education available locally (within 30 miles)? Yes / No
Scope Questions:
Would you like to see the scope of practice for Intermediates be expanded? Yes / No What and why? *(briefly explain)*

Would you like to see any of the following added to the Intermediate scope of practice:
Endtital C02 Capnometry and Pulsoximetry Yes / No
Morphine Sulfate for pain management Yes / No
Ipratropium for brochospasm Yes / No
Benzodiazepine for status seizures and as an anticonvulsant Yes / No

How many hours of additional training are you willing to provide to increase the scope: a)1-5 b)6-10 c)11-15 d) 16-20 e)21-25 f)26+

Are there other items you would you like to see added to the scope and why?
(please use the reverse side to answer this question)
Survey Completed by:_____ Title: _____

APPENDIX O: **Page 3**

EMT Intermediate Provider Survey (12/02)

Demographic Information:
Name *(for checking you off the participant list):* _____

Age:_____ Gender: M / F

Number of years you have been an Intermediate:_____
Number of years you were a Basic before becoming an Intermediate:

In what capacity do you function as an Intermediate? Volunteer / Paid Career
What is your average hospital transport in time & distance: _____ miles / _____minutes
What is your maximum hospital transport in time & distance:_____ miles /
_____ minutes

Average number of EMS calls you respond on per year: _____
Average number of calls you perform ILS intervention on per year:
Average number of ILS skills/drugs you use per year:_____
How often are you the highest level of provider on the scene? _____
How often do you work with a paramedic as a partner?_____

Is it difficult for you to get your required CE hours? Yes / No
Are CE offerings meeting your needs in maintaining your clinical competency? Yes I No

Scope Questions:
Would you like to see the scope of practice for intermediates be expanded? Yes / No What and *why? (briefly explain the reason for your answer)*

Would you like to see any of the following added to the Intermediate scope of practice: Endtital
C02 Capnometry and Pulsoximetry Yes / No
Morphine Sulfate for pain management Yes / No
Ipratropium for brochospasm Yes / No
Benzodiazepine for status seizures and as an anticonvulsant Yes / No

How many hours of additional training are you willing to invest to acquire additional scope: a)1-5 b)6-10 c)11-15 d)16-20 e)21-25 f)26+

Are there other items you would you like to see added to the scope and why.

APPENDIX P: A National Rural Health Snapshot

Source: National Rural Health Association newsletter, 12/06/2002

A National Rural Health Snapshot	Rural	Urban
Percentage of USA Population	20%	80%
Percentage of USA Physicians	11%	89%
Num. of Specialists per 100,000 population*	54.6	190
Population aged 65 and older	18%	15%
Population below the poverty level	14%	11%
Average per capita income	$19K	$26K
Population who are Non-Hispanic Whites	83%	69%
Adults who describe health status as fair/poor	28%	21%
Obese men over the age of 18	22%	18%
Adolescents (Aged 12-17) who smoke	19%	11%
Male death rate per 100,000 (Ages 1-24)	80	60
Female death rate per 100,000 (Ages 1-24)	40	30
Population covered by private insurance	64%	69%
Population who are Medicare beneficiaries	23%	20%
Medicare beneficiaries without drug coverage	45%	31%
Medicare spends per capita compared to USA average	85%	106%
Medicare hospital payment-to-cost ratio	90%	100%
Percentage of poor covered by Medicaid	45%	49%

Statistics used with permission from *"Eye on Health"* by the Rural Wisconsin Health Cooperative, from an article entitled *"Rural Health Can Lead the Way,"* by former NRHA President, Tim Size; Executive Director of the Rural Wisconsin Health Cooperative

* 1996 Figures

APPENDIX Q: **Page 1**

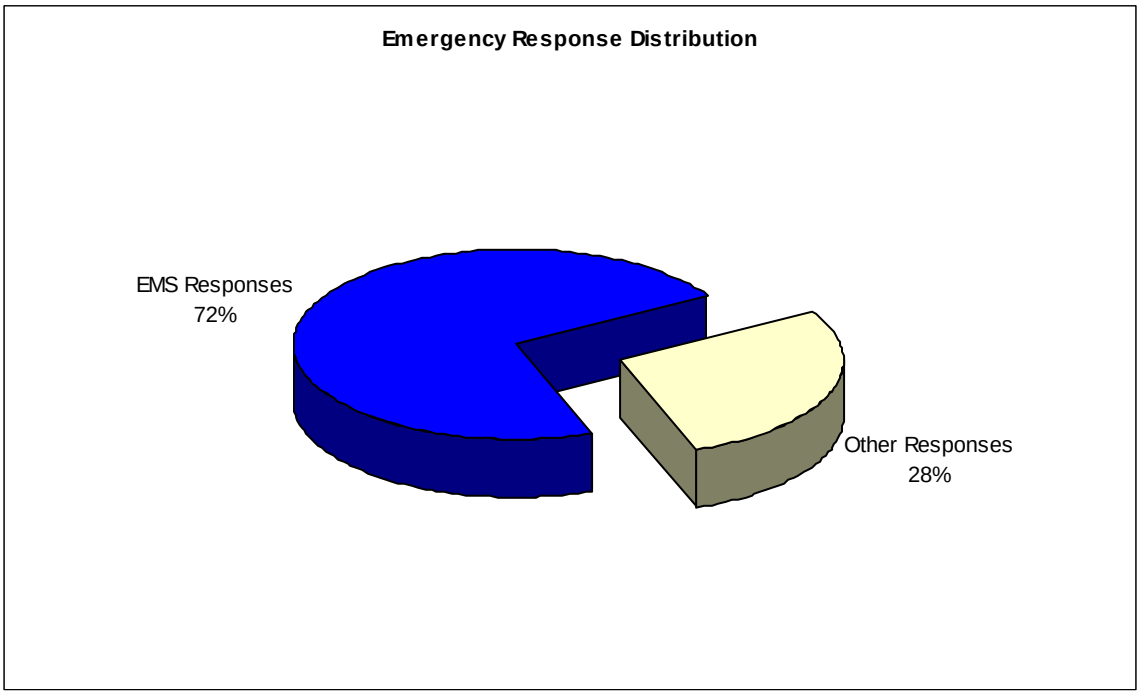


Figure 1

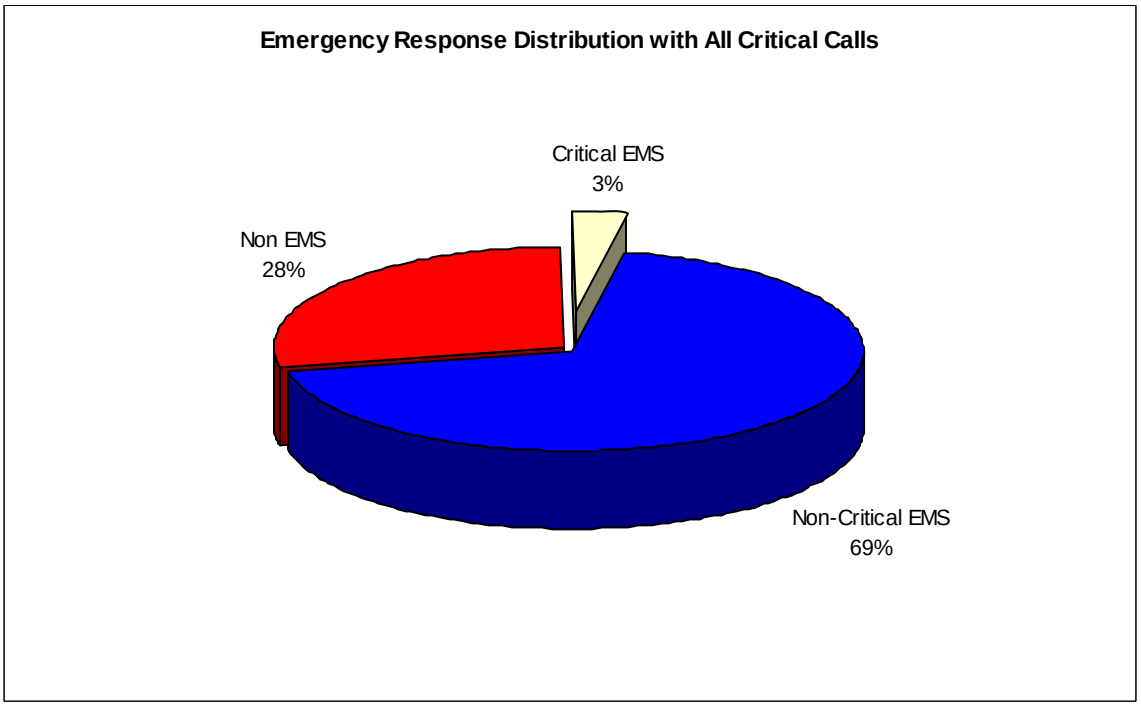


Figure 2

APPENDIX Q:

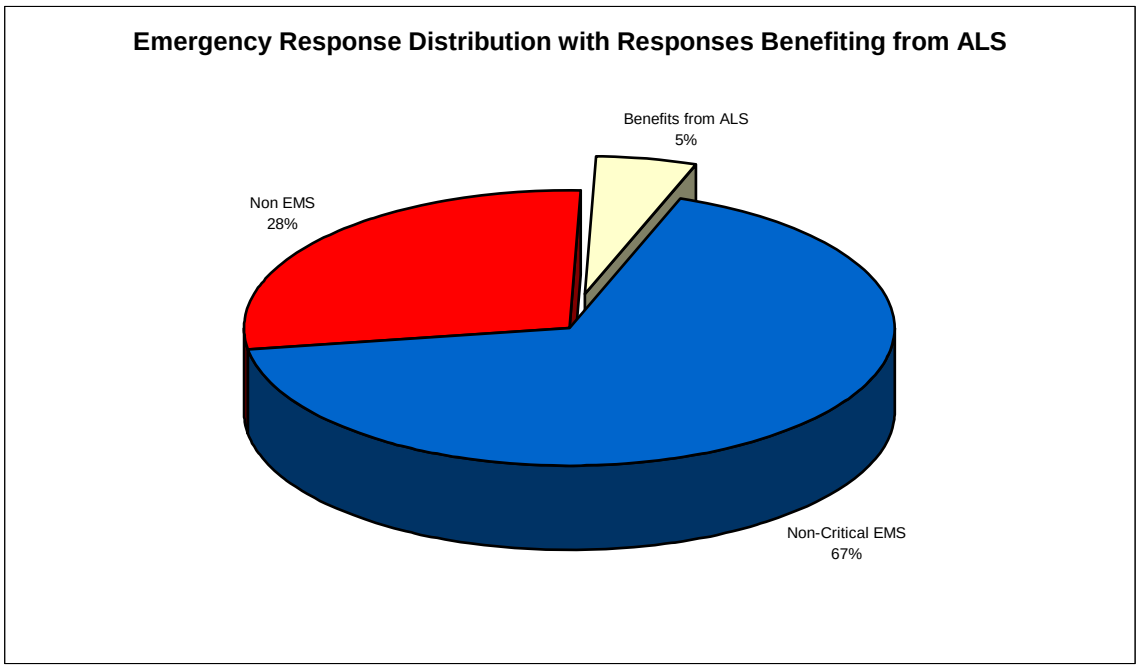


Figure 3

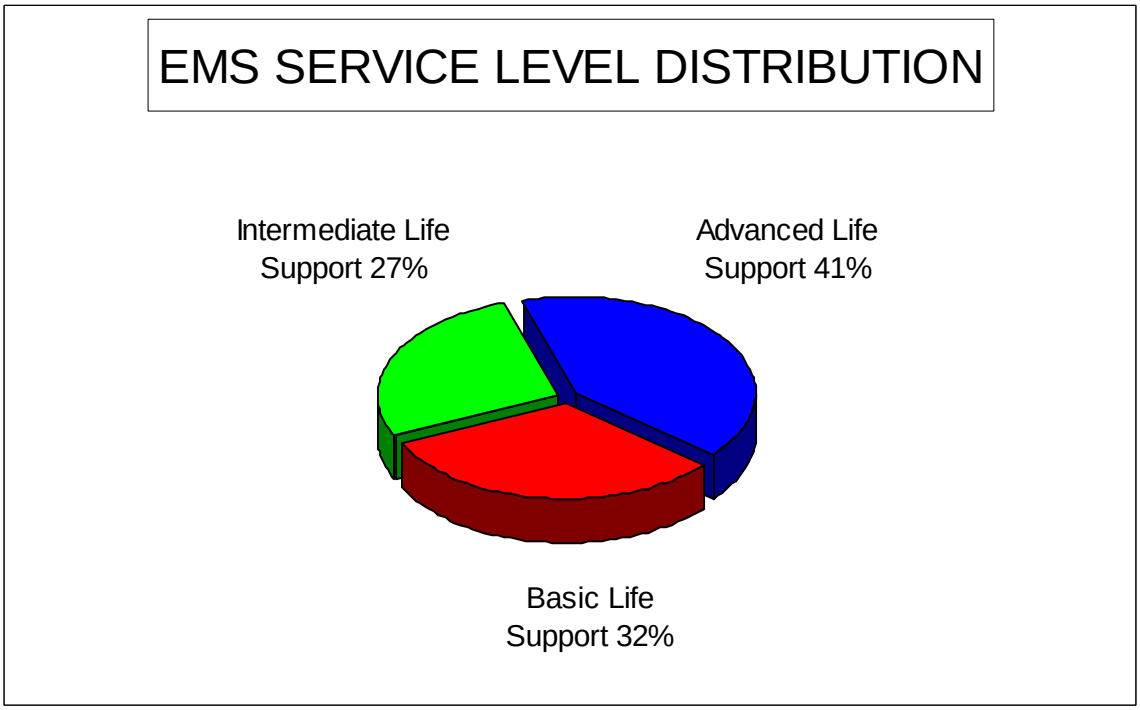


Figure 4

APPENDIX Q: **Page 3**

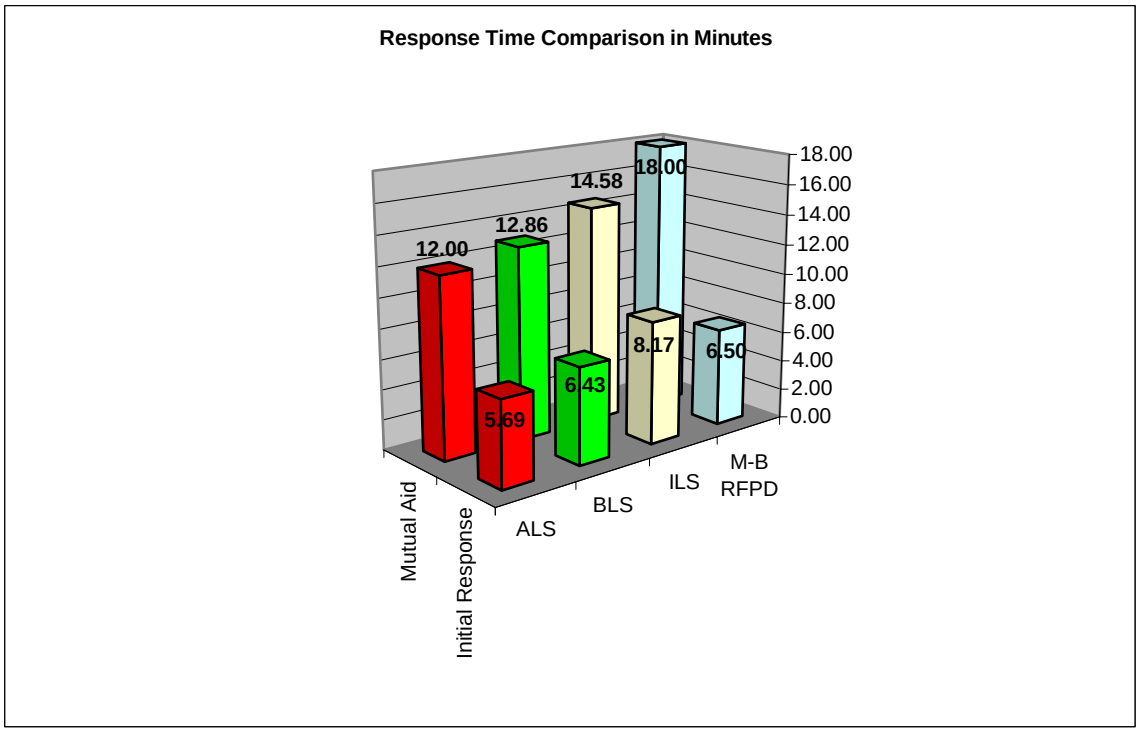


Figure 5

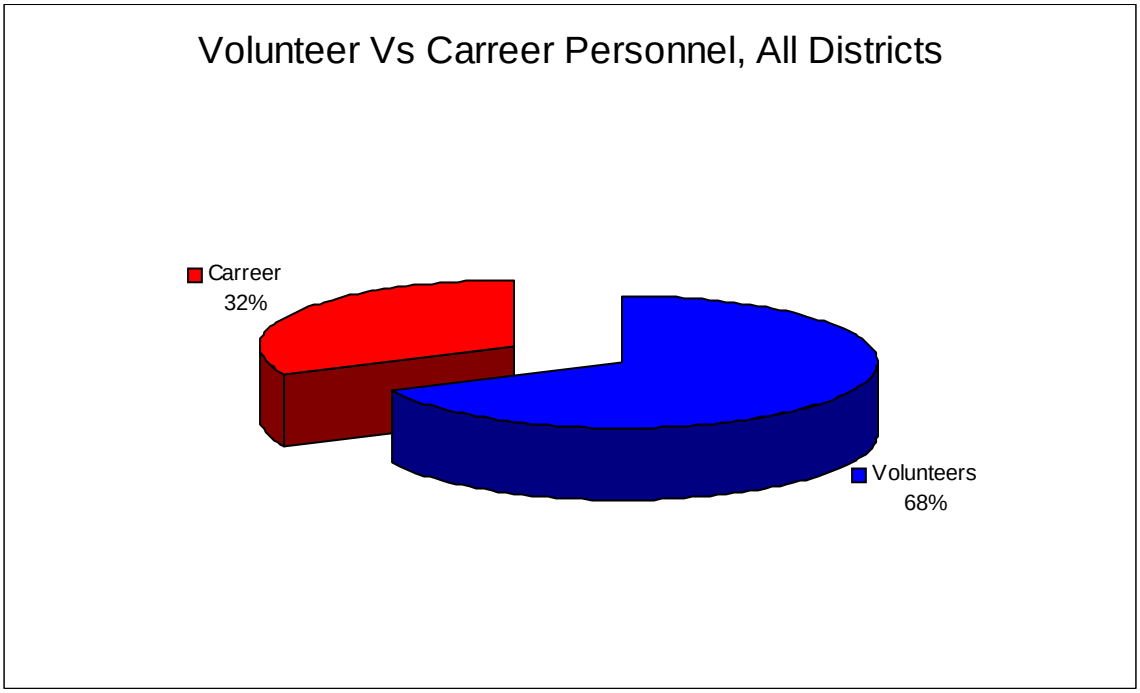


Figure 6

APPENDIX Q: **Page 4**

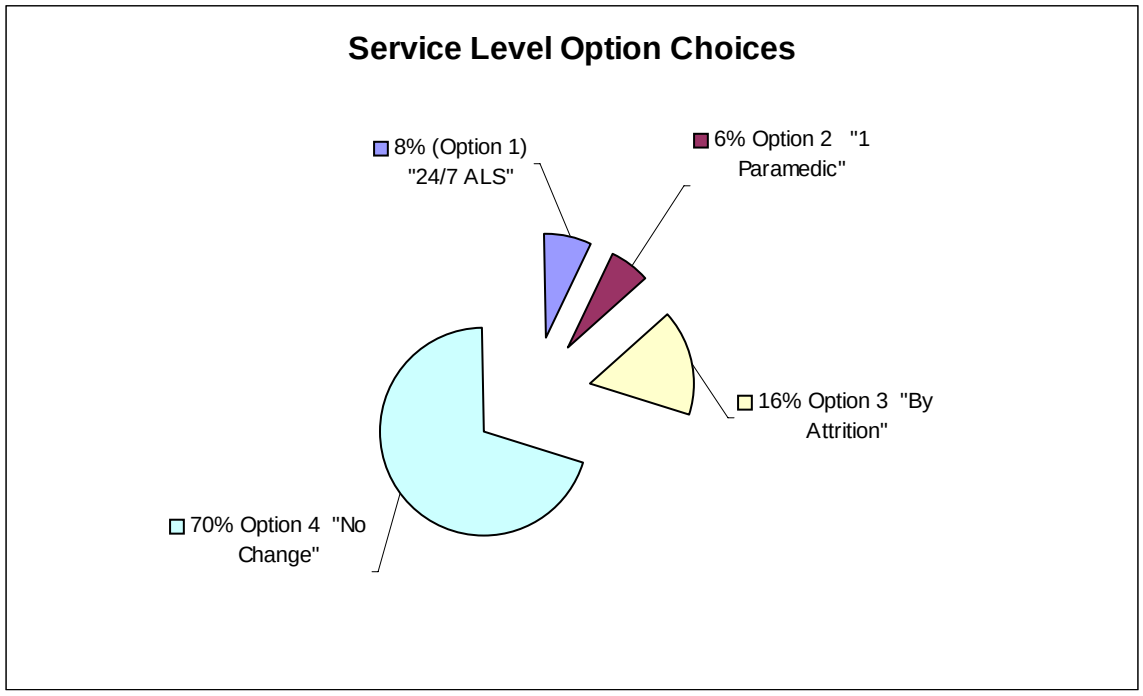


Figure 7

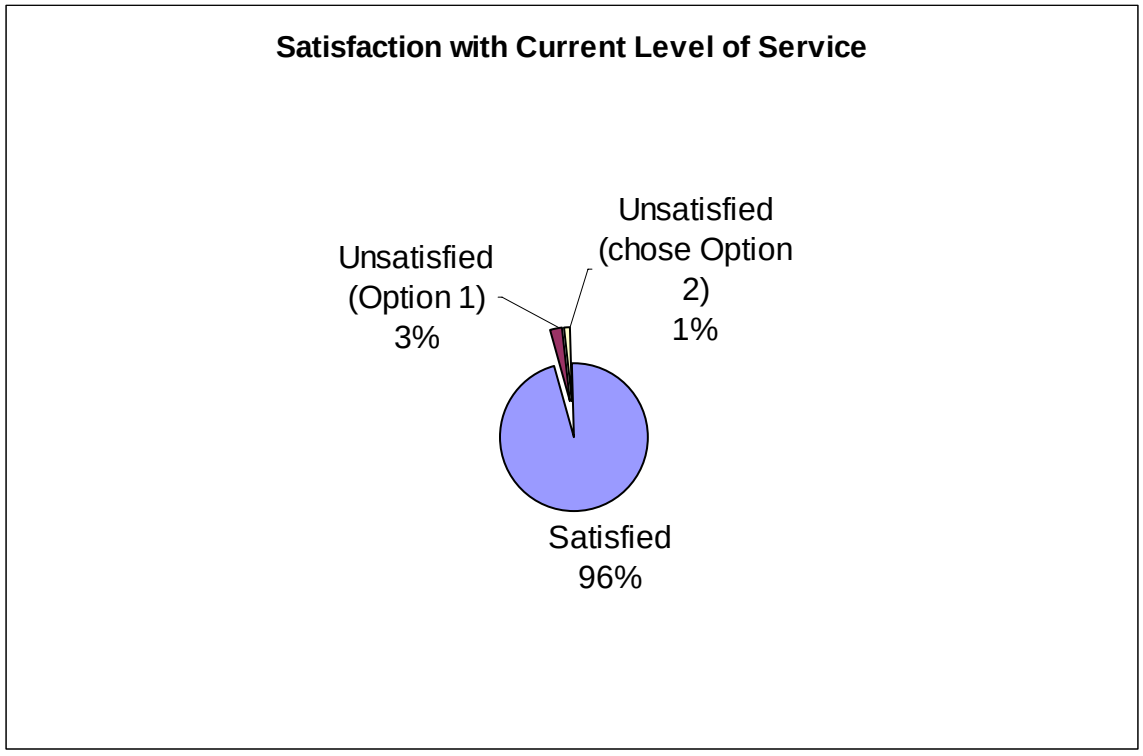


Figure 8

APPENDIX Q: **Page 5**

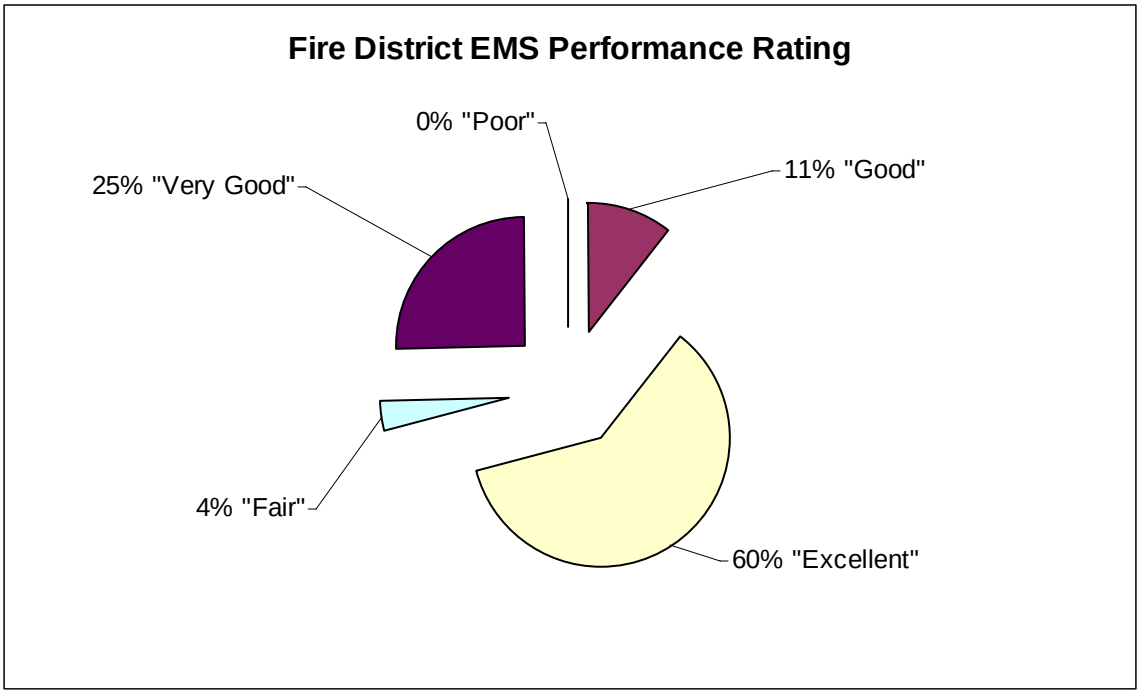


Figure 9

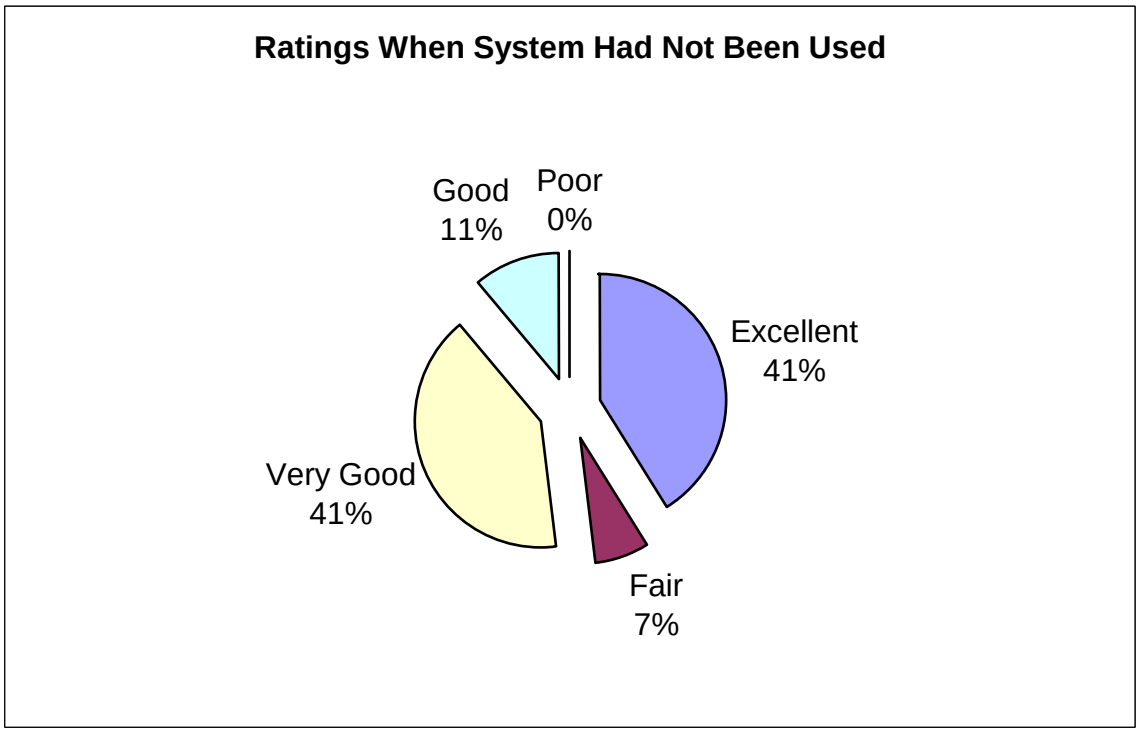


Figure 10

APPENDIX Q: **Page 6**

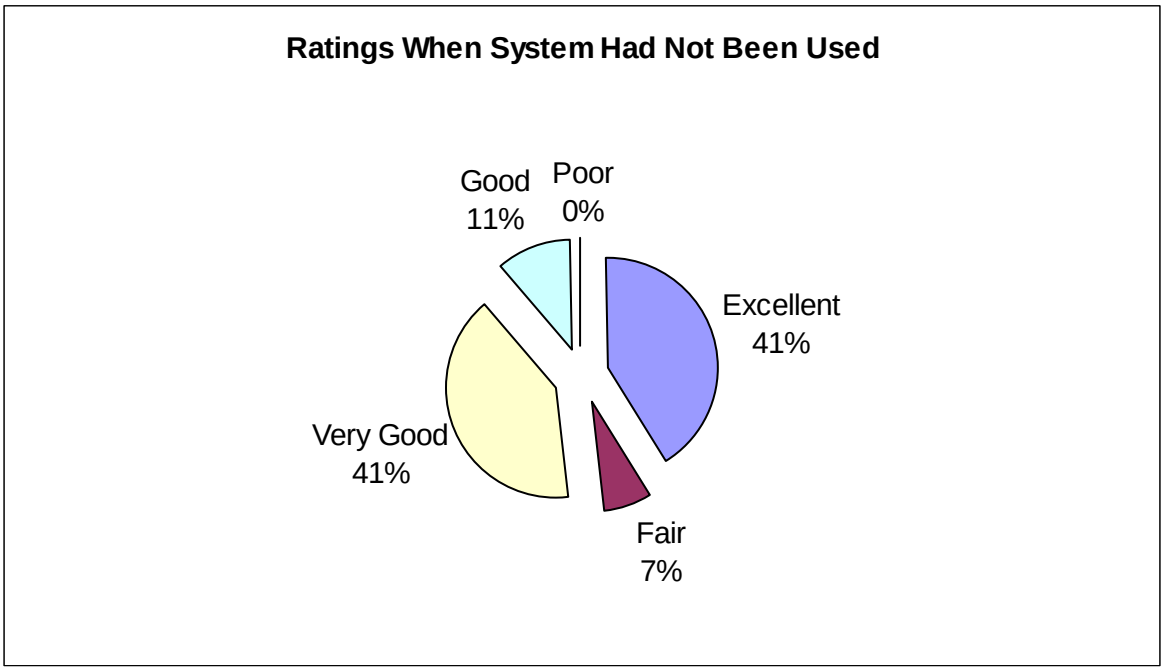


Figure 11

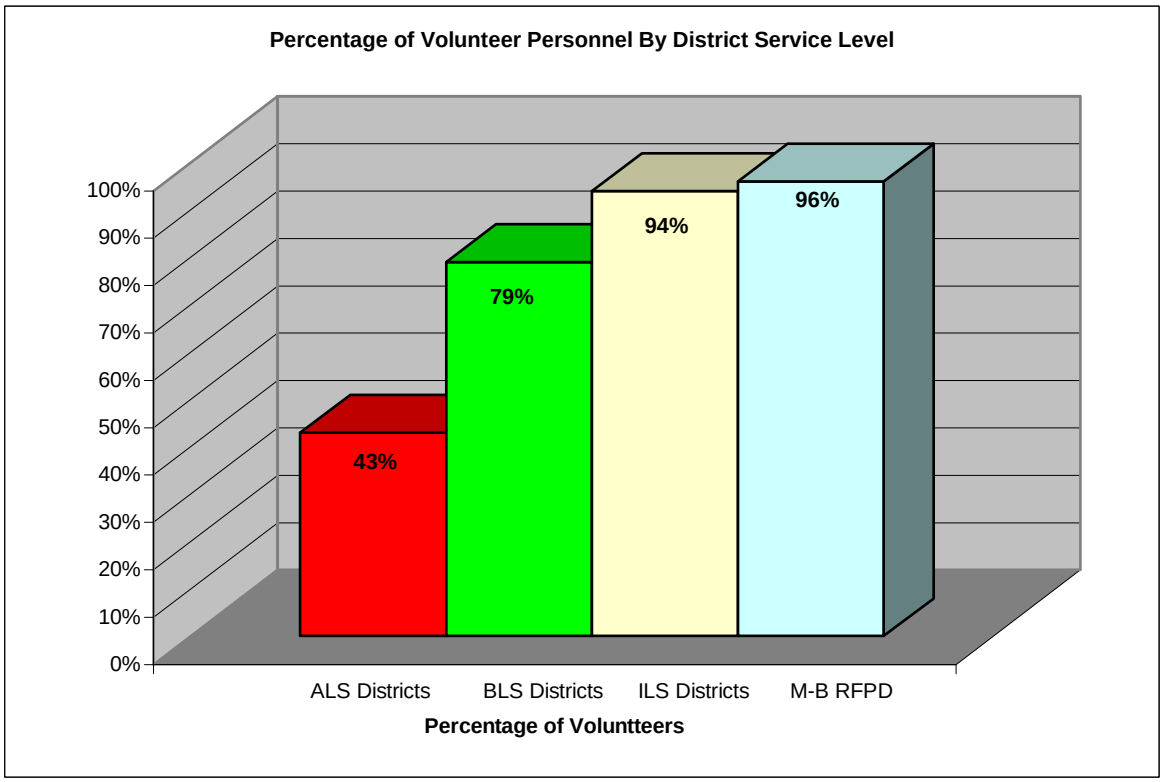


Figure 12

APPENDIX Q: **Page 7**

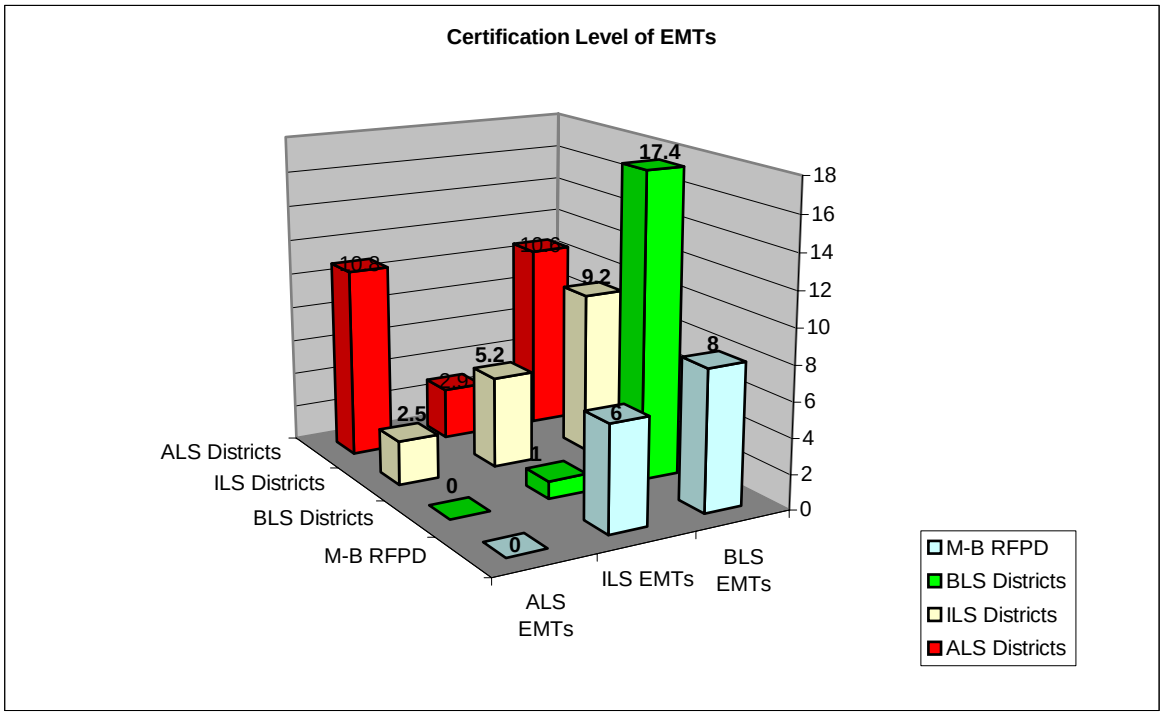


Figure 13

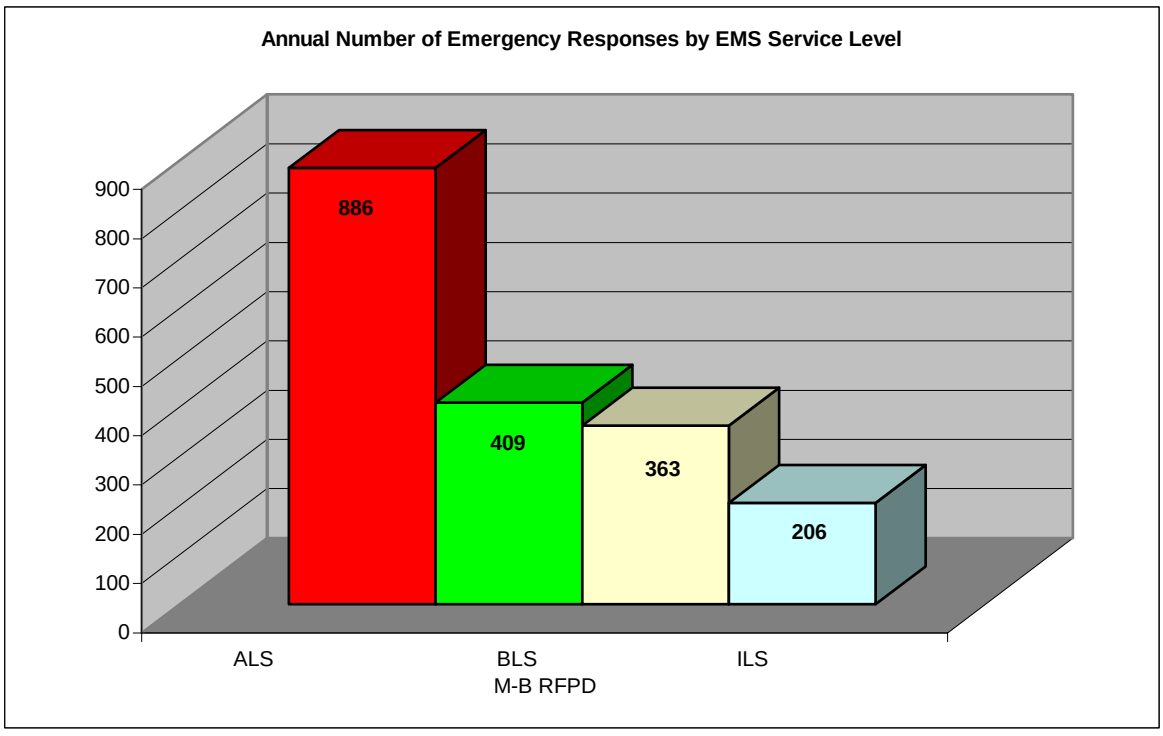


Figure 14

APPENDIX Q: **Page 8**

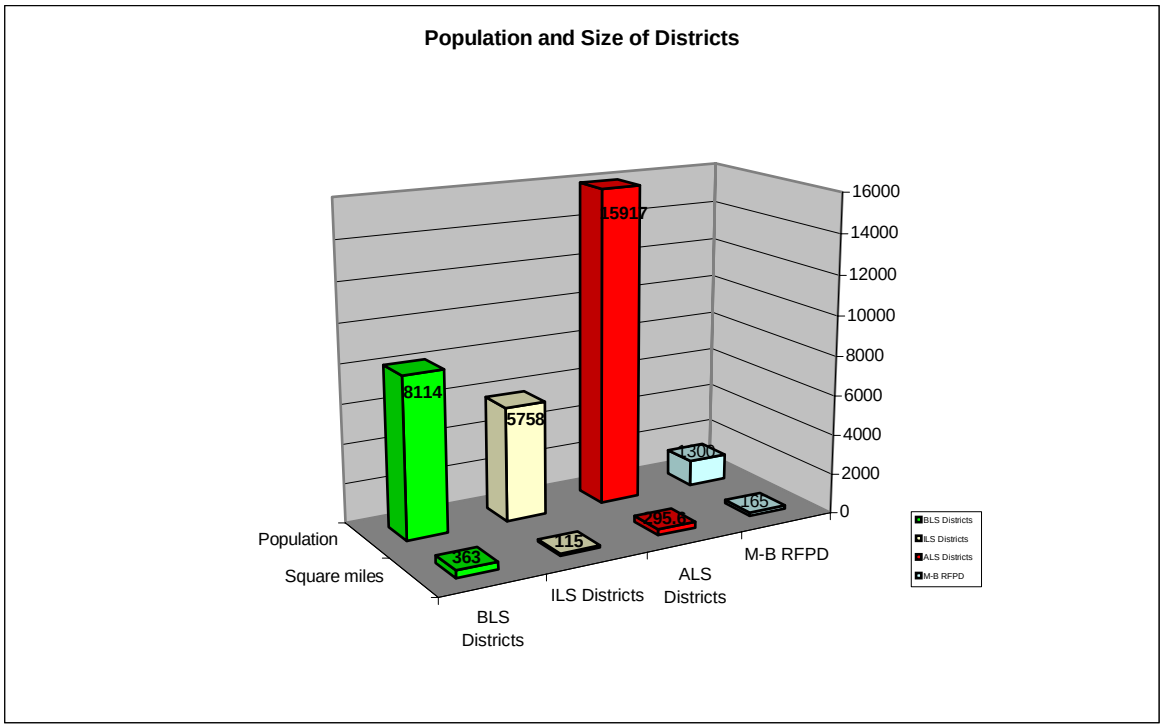


Figure 15

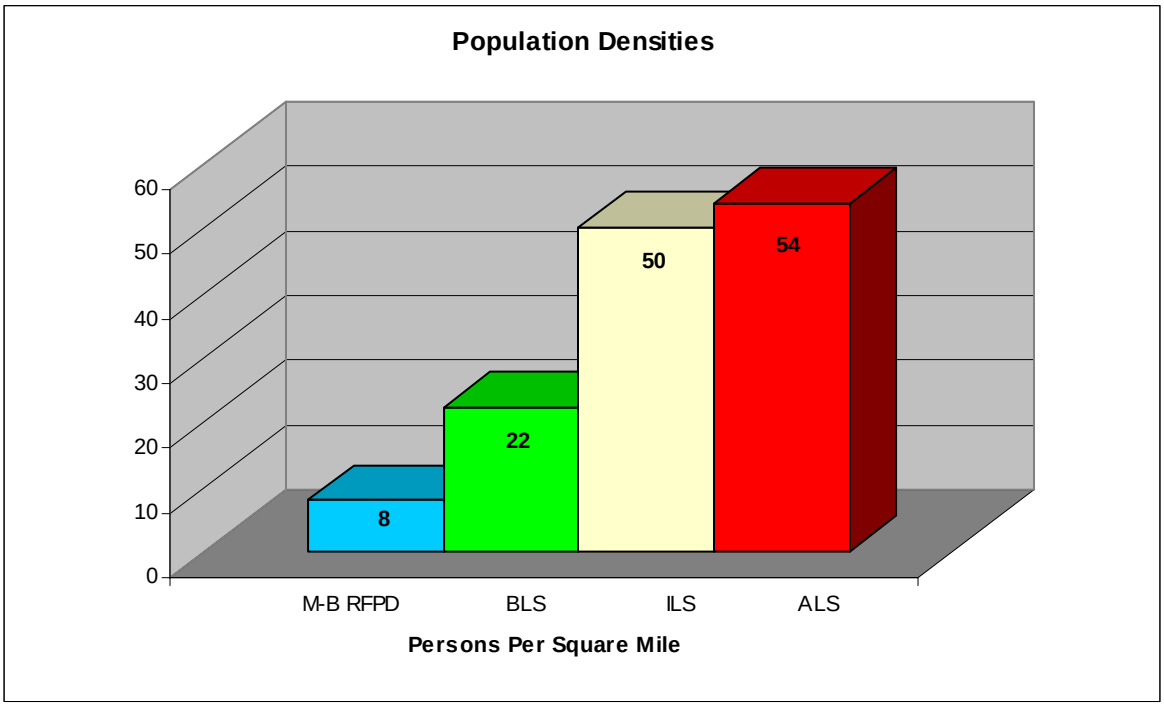


Figure 16

APPENDIX Q: **Page 9**

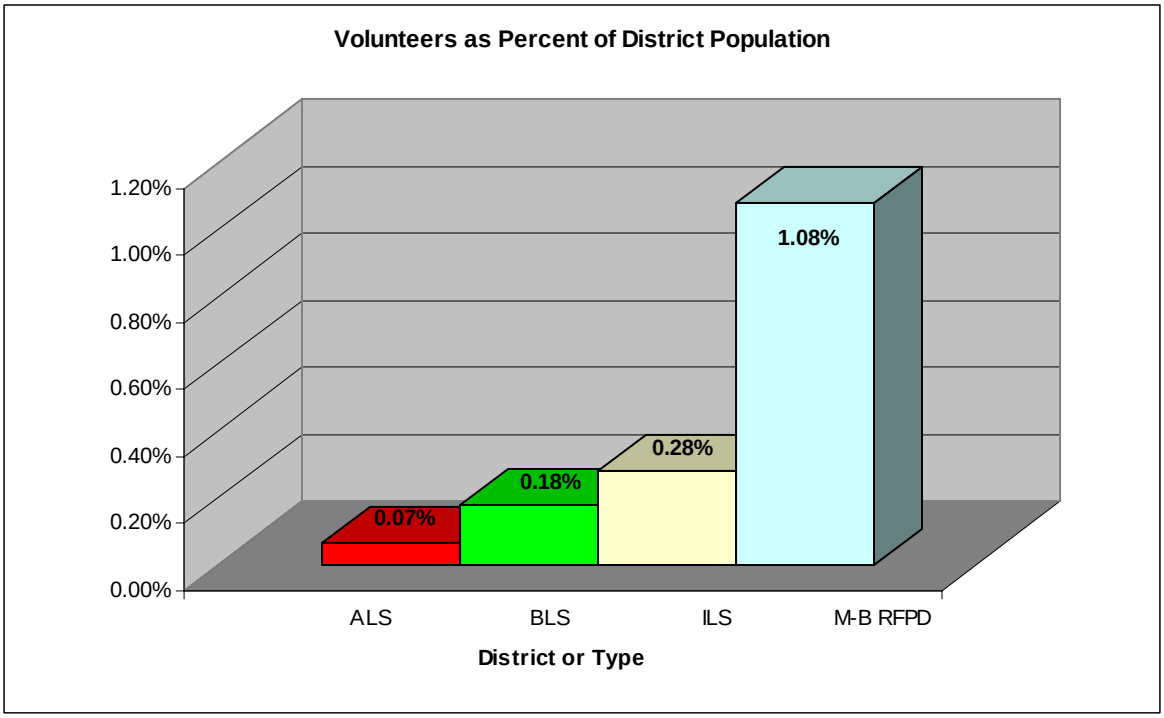


Figure 17

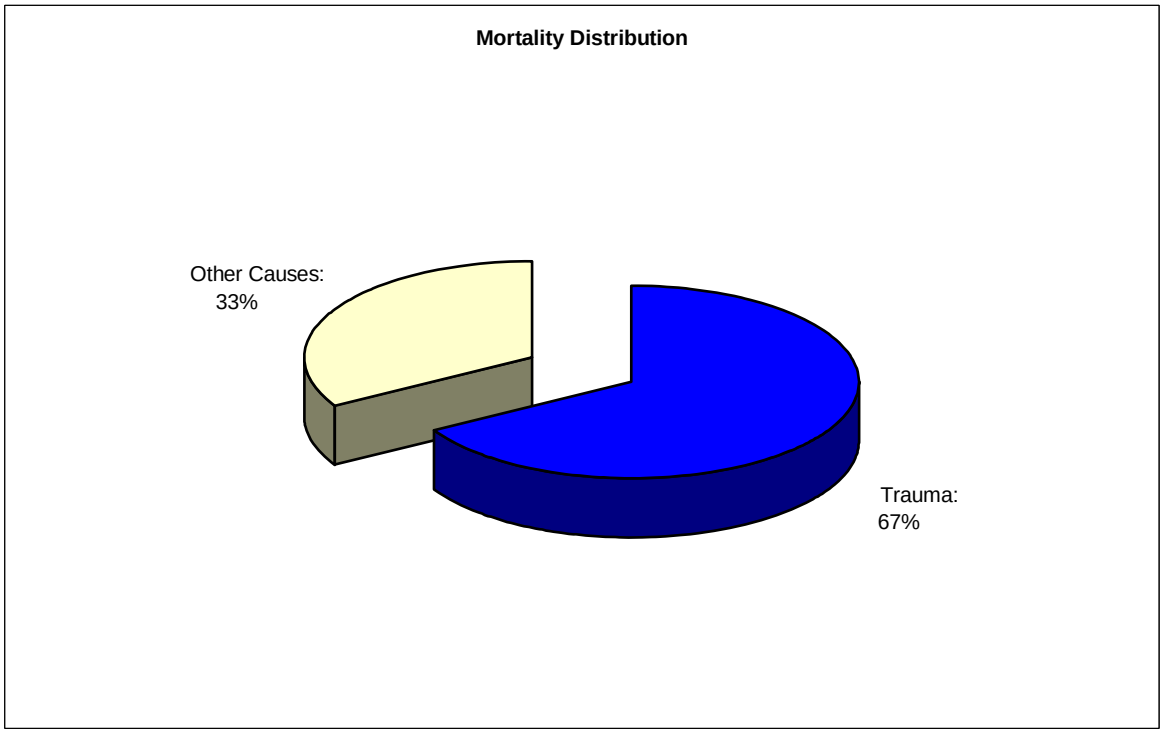
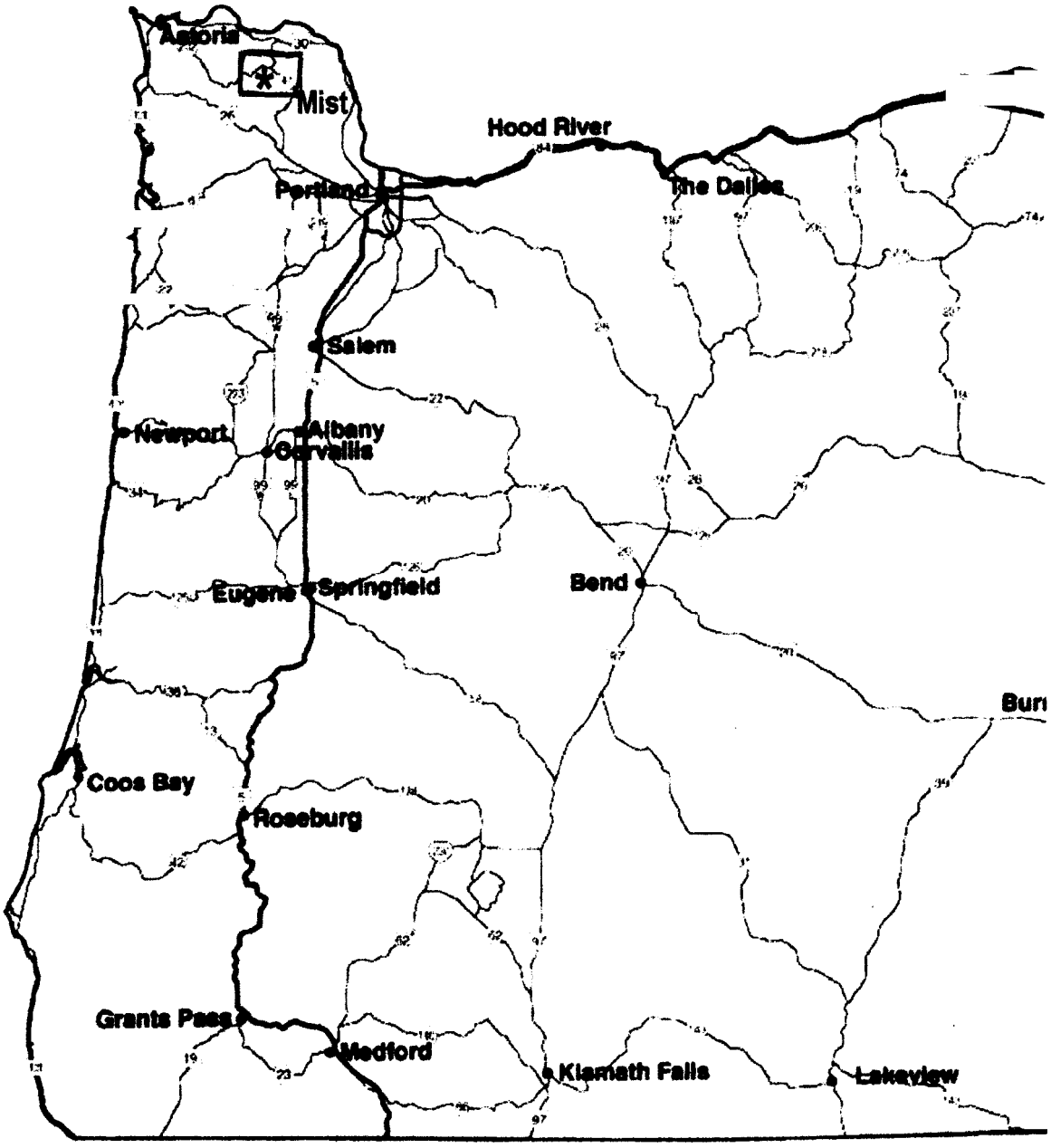


Figure 18

APPENDIX R: **Page 1**

Mist-Birkenfeld RFPD, Located in Northwest Oregon



APPENDIX R: **Page 2**

Economic Data—Oregon Economic & Community Development Department

Oregon Statistical Information

Oregon	1996	1997	1998	1999	2000	2001
Population	3,181,000	3,217,000	3,267,550	3,306,000	3,421,399	3 471,700
Labor Force	1,720,000	1,732,000	1,762,000	1,761,000	1802,938 ‘	1,793,773
Total Employment	1,618,000’	1,631,000	1,664,000	1,660,080	1,715,453	1,679,914
Unemployment	102,000,	101,000	98,000	100,360	87,485’	113,859
Unemployment Rate (%	5.9	5.8	5.6	5.7	4.9	6.3
Non-Farm Pa roll Em lo ment	1,475,000	1,525,000	1,557,000	1,575,100	1,606,800	1,596,100
p y	1,466,126	1,522,053	1,550,148	1,577,666	1,607,911	N/A
	39,654	43,237	45,8041	48,698	52,701	N/A
Average Annual Payroll Per Employee $	27,046	28,407	29,548[1]	30,867[1]	32,776	N/A
Number of Business Units	102,005	107,816	111,215	111,0471	108,432	N/A
Total Personal Income ($ millions)	73,871	79,120	77,579	85,800	94,999	98,500
Annual Per Capita Personal Income ($)	23,111	24,393	23,920	26,000	27,649	28,400
Assessed Value of Property ($ millions)	190,154	166,447	176,089	186,642	198,911	N/A
Residential Construction Building Permits— Value ($ millions)--	 27,814 2,760	 26,999 2,838	 25,854 2,827	 23,249 2,653	 19,877 2,533	 21,049 2,985
Travel Expenditures ($ millions)	4,748	5,018	5,169	5,520	6,069	6,111
Travel-Related Employment	86,600	87,100	90,800	91,200		_9[5,30]0-9[4,100]

-

http://www.econ.state.or.us/orstat.htm 1/18/2003

APPENDIX R: **Page 3**

Assisting Communities—Oregon Economic & Community Development Department

Columbia County Economic Indicators

Columbia County	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Population	40,100	41,500	42,300	42,650	43,560	44,300
Labor Force	21,840	22,160	22,640	22,900	23,460	23,707
Total Employment	20,500	20,800	21,470	21,510	22,260	21,869
Unemployment	1,340	1,360	1,170	1,390	1,200	1,838
Unemployment Rate (%)	6.1	6.1	5.2	6.1	5.1	7.8
Non-Farm Payroll Employment	9,460	9,780	9,930	10,050	10,390	9,930
Total Covered Employment	9,264	9,496	9,793	9,850	10,115	N/A
Covered Payroll ($ thousands)	237,287	250,054	268,026	280,212	293,883	N/A
Average Payroll Per Employee ($)	25,614	26,333	27,369	28,447	29,054	N/A
Personal Income ($ thousands)	893	965	1,025	1,084	1,137	N/A
Annual Per Capita Personal Income ($)	20,917	22,177	23,016	23,889	26,027	N/A
Number of Business Units	882	933	954	947	915	N/A
Net Real Market Value of Property ($ millions)	2,670	2,897	3,063	3,212	3,505	**N/A**
Residential Construction Building Permits- Value ($ thousands)-	 339 38,658	 412 46,333	 N/A N/A	 302 44,725	 278 36,152	 294 35,990
Travel Expenditures ($ thousands)	19,700	19,300	19,400	20,800	23,900	N/A
Travel-Related Employment	460	420	440	440	480	N/A

N/A-Data Is not yet available.

Sources: Oregon Employment Department; Center for Population Research & Census, PSU; Bureau of Economic Analysis; Oregon Tourism Commission; Oregon Department of Revenue; Oregon Economic and Community

Development Department

http://159.121.111.9/FMPro?-db=county_lookups.fp4&-format=datalcoindicators.httn&-la...

1/18/2003

APPENDIX R: **Page 4**

Assisting Communities—Oregon Economic & Community Development Department

Clatsop County Economic Indicators

Clatsop County	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Population	34,600	34,500	34,700	34,750	35,630	35,850
Labor Force	17,510	17,630	17,780	17,320	17,530	17,313
Total Employment	16,400	16,450	16,630	16,330	16,720	16,411
Unemployment	1,110	1,180	1,050	990	810	902
Unemployment Rate (%)	6.3	6.7	5.9	5.7	4.6	5.2
Non-Farm Payroll Employment	14,680	15,190	15,300	15,280	15,500	15,470
Total Covered Employment	14,870	15,498	15,417	15,303	15,479	N/A
Covered Payroll ($ thousands)	326,490	346,233	355,457	371,983	382,758	N/A
Average Payroll Per Employee ($)	21,956	22,340	23,056	24,308	24,728	N/A
Personal Income ($ thousands)	737	780	807	841	871	N/A
Annual Per Capita Personal Income ($)	20,978	22,020	22,817	23,800	24,491	N/A
Number of Business Units	1,372	1,436	1,479	1,463	1,392	N/A
Net Real Market Value of Property ($ millions)	3,209	3,594	3,891	4,064	4,396	**N/A**
Residential Construction Building Permits- Value ($ thousands)-	 298 28,505	 227 23,398	 N/A N/A	 147 23,275	 154 22,498	 138 22,132
Travel Expenditures ($ thousands)	225,000	234,700	246,900	261,600	285,200	N/A
Travel-Related Employment	4,550	4,480	4,720	4,890	5,260	N/A

N/A-Data is not yet available.

Sources: Oregon Employment Department; Center for Population Research & Census, PSU; Bureau of Economic Analysis; Oregon Tourism Commission; Oregon Department of Revenue; Oregon Economic and Community Development Department

http://159.121.111.91FMPro?-db=county lookups.fp4&-format=datalcoindicators.httn&-la...
1/18/2003

APPENDIX R: **Page 5**

Economic Data/Statistical Information—Partial Distressed Area List 2000

Cities directly linked to Mist-Birkenfeld RFPD are listed in bold type.

County	Distressed City or Other Area	Index
Benton	Monroe	1.45
Clackamas	Estacada	1.59
	Johnson City	1.26
	Molalla	1.42
Clatsop	**Astoria**	**1.29**
Columbia	**Clatskanie**	**1.28**
	Prescott	1.54
	Rainier	**1.32**
	Vernonia	**1.35**
Curry	Brookings	1.27
	Gold Beach	1.41
	Port Orford	1.62
Deschutes	Redmond	1.30
	Sisters	2.09

APPENDIX S: **Page 1**

MIST-BIRKENFELD RURAL FIRE PROTECTION DISTRICT
12525 Hwy. 202, Mist, OR 97016
(503)755-2710 or (503)755-0510
Fax (503)755-2556

January 14, 2003

Board of Directors
Mist-Birkenfeld RFPD
12525 Highway 202
Mist, Oregon 97016
Regarding: EMS Service Level Research Project

Dear Chairman DeJager,

As you know, I have been researching the EMS level of service that the citizens of the fire district desire and are willing to support. That research is complete. The recommendations are attached to this letter for presentation at tonight's meeting. Also attached are the specific research findings upon which the recommendations were based. At the end of the presentation the board of directors will each receive a copy of the entire research document.

At the regular business meeting on February 11, after the Board has had an opportunity to review the materials provided, I will ask for adoption of the recommendations as fire district action objectives.

Thank you for the opportunity to pursue this research project. I believe the recommendations will be helpful.

Sincerely,

Chief Dave Crawford

APPENDIX S: **Page 2**

RECOMMENDATION

The research indicates that the recommendations for action that follow, based on specific findings, will appropriately and materially address the stated problem and the identified issues that surround it.

Recommendation #1: Based upon research Findings #1 through #5, no change in level of service should be planned unless such plan can include the cost of development of the program and of its operation in the budget produced by the current tax rate. Special attention should be given to the possibility of attaining the ALS service level without additional funding. This may be done by requiring any new employees for currently supported positions to be certified as paramedics.

Recommendation #2: Based on Finding #9, improvements in the quality of EMS service available in Mist-Birkenfeld RFPD should be sought. At a minimum the vehicles for program improvement should include enhancements to the EMS training program to gain the cutting edge, creation or enhancement of a regional EMS training association, development of volunteer personnel in terms of leadership, development of volunteer staff in terms of training and instructional skills, and development of volunteer staff in terms of expanding both personal and professional skills. Additionally, expansion of the ILS scope of practice should be encouraged and supported, locally, on a state level, and nationally.

Recommendation #3: Based upon Finding #9, it is recommended that the fire district plans recognize and embrace change, understanding that change is the natural order of social organization.

Recommendation #4: Based on Finding #8, regular EMS data tracking should be implemented, and that the data produced should illuminate specific, concise, clearly identified operational goals, objectives and including definitions of terms and concepts critical to such data.

Recommendation #5: Based on Finding # 10, identify and develop alternative financing to implement the adopted Mission of the fire district and to further each of the goals of its strategic plan.

Recommendation #6: Based on Findings #12 and #13, formally recognize and include in planning efforts the size and character of the fire district's operating environment, understanding the limitations linked with that size and character as well as the strengths inherent with that make up. A low population density imposes a correspondingly high cost on the citizens for universal public services. However, having limited emergency medical services is a trade-off many residents are willing to make for the peace and solitude of a rural or frontier environment.

Recommendation #7: Based on Findings #6, #7, and #14, planning efforts should take into consideration the value of the relationship the fire district has with the community, as evidenced by the high regard the community holds for the fire district's EMS program and by the phenomenally high percentage of community citizens who volunteer for the fire district.

Recommendation #8: Based on Finding # 11, seek ways to recognize the efforts of the volunteers of the district who make up 96% of its personnel who make carrying out the mission of the fire district possible. The district should assist them to develop personally

and professionally, recognizing that the primary job of fire district staff is to develop and nurture the volunteers.

APPENDIX S: **Page 4**

RESEARCH FINDINGS

Finding #1: Based on DC Berg's report, there is no positive correlation between lives lost and lack of an ALS program.

Finding #2: Based upon the occurrence of critical calls, ALS techniques were necessary on an average of 2.5% of the emergency medical calls for service.

Finding #3: Based upon the number of patients who may have benefited from ALS medications or techniques, ALS techniques or medications may have benefited as many as an additional 2.5% of the patients on calls responded to during the period of the study.

Finding #4: The options identified to be included in the Emergency Medical Service Level Survey were: *ALS available 24 hours/7 days per week* at a cost of $1.63 per $1000 valuation ($163 per year on a $100,000 home); *ALS available about 20% of the time* at accost of $ .70 per $1000 valuation ($70 per year on a $100,000 home); *ALS available in 7 to 10 years through attrition* at a cost of $ .20 per $1000 valuation ($20 per year on a $100,000 home); *Continue with ILS service that is now available* $ 0.00 (no change in property tax rate)

Finding #5: Based on the results of the Emergency Medical Service Level Survey, the clear EMS service level choice of the community is that the level of service should remain unchanged.

APPENDIX S: **Page 5**

Finding #6: Based on the results of the Emergency Medical Service Level Survey, the community holds the fire district's current EMS program in extremely high regard.

Finding #7: Based on the results of the Emergency Medical Service Level Survey, there is a high positive correlation between use of the EMS program and regard for the EMS program.

Finding #8: Based on information gathered and developed for this research paper, careful EMS data tracking and evaluation based on clear, concise program goals is critical to determining the effectiveness of each EMS program or any of its components.

Finding #9: Based on information gathered and developed for this research paper, improvements in the quality of service while maintaining the ILS level of EMS service are possible.

Finding #10: Based on information gathered and developed for this research paper, development of alternative, long term financial support is critical to growth beyond simply keeping pace with the population.

Finding #11: Based on information gathered and developed for this research paper, volunteer personnel are the backbone of the fire district's ability to carry out its mission. Therefore, training, nurturing, and recognizing the district's volunteers is the primary responsibility of staff and management.

APPENDIX S: **Page 6**

Finding #12: Based on the comparative information presented above, Mist-Birkenfeld most closely matches the characteristics of an ILS fire district.

Finding #13: Based on the comparative information presented above, Mist-Birkenfeld RFPD has a population density far below the average of any of the surveyed fire districts.

Finding #14: Based on the results of the EMS Program Survey when compared to Mist-Birkenfeld RFPD statistics, Mist-Birkenfeld RFPD is experiencing a very strong rate of volunteerism when compared to like districts.